Red Hat Enterprise Virtualization 3.0
Quick Start Guide

Getting Started with Red Hat Enterprise Virtualization
Edition 1

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Edition 1

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Abstract

This document is a step-by-step guide for first-time users to install and configure a basic Red Hat Enterprise Virtualization environment and create virtual machines.

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Preface

The Red Hat Enterprise Virtualization platform is a virtualization management solution providing fully integrated management for virtual machines. Based on the leading open source virtualization platform, it provides superior technical capabilities and scalability for virtual environments.

1. About this Guide

This guide enables you to install and configure Red Hat Enterprise Virtualization and create your first virtual machine.

1.1. Audience

This document is designed as a guide for system administrators to set up Red Hat Enterprise Virtualization for the first time. It covers the deployment of Red Hat Enterprise Virtualization across multiple hosts using three different storage types. After completing this guide, you will have a basic working Red Hat Enterprise Virtualization environment which can be scaled and further configured for deployment across large enterprises.

It is recommended that the users of this document have advanced Linux or Windows systems administration experience, including familiarity with virtual machine data center operations.

1.2. Overview

The Quick Start Guide takes you through the following tasks:

- Installing the Red Hat Enterprise Virtualization Manager and Hypervisor
- Configuring hosts, clusters, storage and networking
- Creating and accessing virtual machines

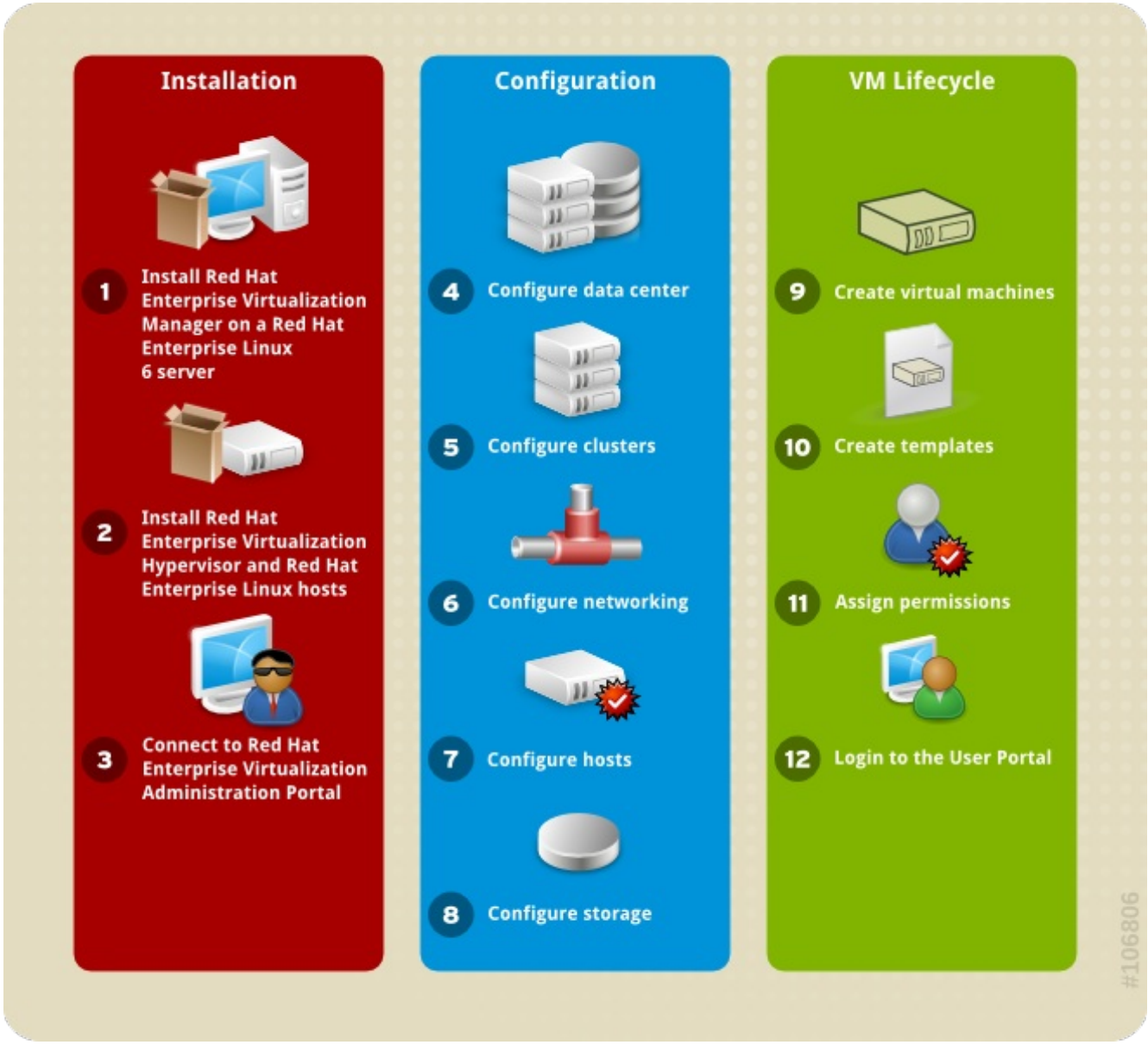
Installation
1 Install Red Hat Enterprise Virtualization Manager on a Red Hat Enterprise Linux 6 server
2 Install Red Hat Enterprise Virtualization Hypervisor and Red Hat Enterprise Linux hosts
3 Connect to Red Hat Enterprise Virtualization Administration Portal
Configuration
4 Configure data center
5 Configure clusters
6 Configure networking
7 Configure hosts
8 Configure storage
VM Lifecycle
9 Create virtual machines
10 Create templates
11 Assign permissions
12 Login to the User Portal
#106806

Figure 1. Workflow of setting up Red Hat Enterprise Virtualization

1.3. Documentation Suite

The Red Hat Enterprise Virtualization documentation suite provides information on installation, development of applications, configuration and usage of the Red Hat Enterprise Virtualization platform and its related products.

- *Red Hat Enterprise Virtualization — Administration Guide* describes how to setup, configure and manage Red Hat Enterprise Virtualization. It assumes that you have successfully installed the Red Hat Enterprise Virtualization manager and hosts.
- *Red Hat Enterprise Virtualization — Evaluation Guide* enables prospective customers to evaluate the features of Red Hat Enterprise Virtualization. Use this guide if you have an evaluation license.
- *Red Hat Enterprise Virtualization — Installation Guide* describes the installation prerequisites and procedures. Read this if you need to install Red Hat Enterprise Virtualization. The installation of hosts, manager and storage are covered in this guide. You will need to refer to the *Red Hat Enterprise Virtualization Administration Guide* to configure the system before you can start using the platform.

- *Red Hat Enterprise Virtualization — Manager Release Notes* contain release specific information for Red Hat Enterprise Virtualization Managers.
- *Red Hat Enterprise Virtualization — Power User Portal Guide* describes how power users can create and manage virtual machines from the Red Hat Enterprise Virtualization user portal.
- *Red Hat Enterprise Virtualization — Quick Start Guide* (the book you are reading) provides quick and simple instructions for first time users to set up a basic Red Hat Enterprise Virtualization environment.
- *Red Hat Enterprise Virtualization — REST API Guide* describes how to use the REST API to set up and manage virtualization tasks. Use this guide if you wish to develop systems which integrate with Red Hat Enterprise Virtualization, using an open and platform independent API.
- *Red Hat Enterprise Virtualization — Technical Reference Guide* describes the technical architecture of Red Hat Enterprise Virtualization and its interactions with existing infrastructure.
- *Red Hat Enterprise Virtualization — User Portal Guide* describes how users of the Red Hat Enterprise Virtualization system can access and use virtual desktops.
- *Red Hat Enterprise Linux — Hypervisor Deployment Guide* describes how to deploy and install the hypervisor. Read this guide if you need advanced information about installing and deploying Hypervisors. The basic installation of Hypervisor hosts is also described in the *Red Hat Enterprise Virtualization Installation Guide*.
- *Red Hat Enterprise Linux — V2V Guide* describes importing virtual machines from KVM, Xen and VMware ESX to Red Hat Enterprise Virtualization and KVM managed by libvirt.

2. Document Conventions

This manual uses several conventions to highlight certain words and phrases and draw attention to specific pieces of information.

In PDF and paper editions, this manual uses typefaces drawn from the Liberation Fonts set. The Liberation Fonts set is also used in HTML editions if the set is installed on your system. If not, alternative but equivalent typefaces are displayed. Note: Red Hat Enterprise Linux 5 and later include the Liberation Fonts set by default.

2.1. Typographic Conventions

Four typographic conventions are used to call attention to specific words and phrases. These conventions, and the circumstances they apply to, are as follows.

`Mono-spaced Bold`

Used to highlight system input, including shell commands, file names and paths. Also used to highlight keys and key combinations. For example:

> To see the contents of the file **`my_next_bestselling_novel`** in your current working directory, enter the **`cat my_next_bestselling_novel`** command at the shell prompt and press **`Enter`** to execute the command.

The above includes a file name, a shell command and a key, all presented in mono-spaced bold and all distinguishable thanks to context.

Key combinations can be distinguished from an individual key by the plus sign that connects each part of a key combination. For example:

> Press **`Enter`** to execute the command.

Press **Ctrl**+**Alt**+**F2** to switch to a virtual terminal.

The first example highlights a particular key to press. The second example highlights a key combination: a set of three keys pressed simultaneously.

If source code is discussed, class names, methods, functions, variable names and returned values mentioned within a paragraph will be presented as above, in **mono-spaced bold**. For example:

File-related classes include **filesystem** for file systems, **file** for files, and **dir** for directories. Each class has its own associated set of permissions.

Proportional Bold

This denotes words or phrases encountered on a system, including application names; dialog box text; labeled buttons; check-box and radio button labels; menu titles and sub-menu titles. For example:

Choose **System** → **Preferences** → **Mouse** from the main menu bar to launch **Mouse Preferences**. In the **Buttons** tab, select the **Left-handed mouse** check box and click **Close** to switch the primary mouse button from the left to the right (making the mouse suitable for use in the left hand).

To insert a special character into a **gedit** file, choose **Applications** → **Accessories** → **Character Map** from the main menu bar. Next, choose **Search** → **Find...** from the **Character Map** menu bar, type the name of the character in the **Search** field and click **Next**. The character you sought will be highlighted in the **Character Table**. Double-click this highlighted character to place it in the **Text to copy** field and then click the **Copy** button. Now switch back to your document and choose **Edit** → **Paste** from the **gedit** menu bar.

The above text includes application names; system-wide menu names and items; application-specific menu names; and buttons and text found within a GUI interface, all presented in proportional bold and all distinguishable by context.

Mono-spaced Bold Italic or ***Proportional Bold Italic***

Whether mono-spaced bold or proportional bold, the addition of italics indicates replaceable or variable text. Italics denotes text you do not input literally or displayed text that changes depending on circumstance. For example:

To connect to a remote machine using ssh, type **ssh *username*@*domain.name*** at a shell prompt. If the remote machine is **example.com** and your username on that machine is john, type **ssh john@example.com**.

The **mount -o remount *file-system*** command remounts the named file system. For example, to remount the **/home** file system, the command is **mount -o remount /home**.

To see the version of a currently installed package, use the **rpm -q *package*** command. It will return a result as follows: ***package-version-release***.

Note the words in bold italics above — username, domain.name, file-system, package, version and release. Each word is a placeholder, either for text you enter when issuing a command or for text displayed by the system.

Aside from standard usage for presenting the title of a work, italics denotes the first use of a new and important term. For example:

Publican is a *DocBook* publishing system.

2.2. Pull-quote Conventions

Terminal output and source code listings are set off visually from the surrounding text.

Output sent to a terminal is set in **mono-spaced roman** and presented thus:

```
books        Desktop   documentation  drafts  mss    photos   stuff  svn
books_tests  Desktop1  downloads      images  notes  scripts  svgs
```

Source-code listings are also set in **mono-spaced roman** but add syntax highlighting as follows:

```
static int kvm_vm_ioctl_deassign_device(struct kvm *kvm,
                  struct kvm_assigned_pci_dev *assigned_dev)
{
         int r = 0;
         struct kvm_assigned_dev_kernel *match;

         mutex_lock(&kvm->lock);

         match = kvm_find_assigned_dev(&kvm->arch.assigned_dev_head,
                                       assigned_dev->assigned_dev_id);
         if (!match) {
                 printk(KERN_INFO "%s: device hasn't been assigned before, "
                   "so cannot be deassigned\n", __func__);
                 r = -EINVAL;
                 goto out;
         }

         kvm_deassign_device(kvm, match);

         kvm_free_assigned_device(kvm, match);

out:
         mutex_unlock(&kvm->lock);
         return r;
}
```

2.3. Notes and Warnings

Finally, we use three visual styles to draw attention to information that might otherwise be overlooked.

Note

Notes are tips, shortcuts or alternative approaches to the task at hand. Ignoring a note should have no negative consequences, but you might miss out on a trick that makes your life easier.

Important

Important boxes detail things that are easily missed: configuration changes that only apply to the current session, or services that need restarting before an update will apply. Ignoring a box labeled 'Important' will not cause data loss but may cause irritation and frustration.

Warning

Warnings should not be ignored. Ignoring warnings will most likely cause data loss.

3. We Need Feedback!

If you find a typographical error in this manual, or if you have thought of a way to make this manual better, we would love to hear from you! Please submit a report in Bugzilla: http://bugzilla.redhat.com/ against the product **Red Hat Enterprise Virtualization Manager**.

When submitting a bug report, be sure to mention the manual's identifier: *Guides-Quick Start*.

If you have a suggestion for improving the documentation, try to be as specific as possible when describing it. If you have found an error, include the section number and some of the surrounding text so we can find it easily.

Chapter 1. Introduction

The Red Hat Enterprise Virtualization platform comprises various components which work seamlessly together, enabling the system administrator to install, configure and manage a virtualized environment. After reading this guide, you will be able to set up Red Hat Enterprise Virtualization as represented in the following diagram:

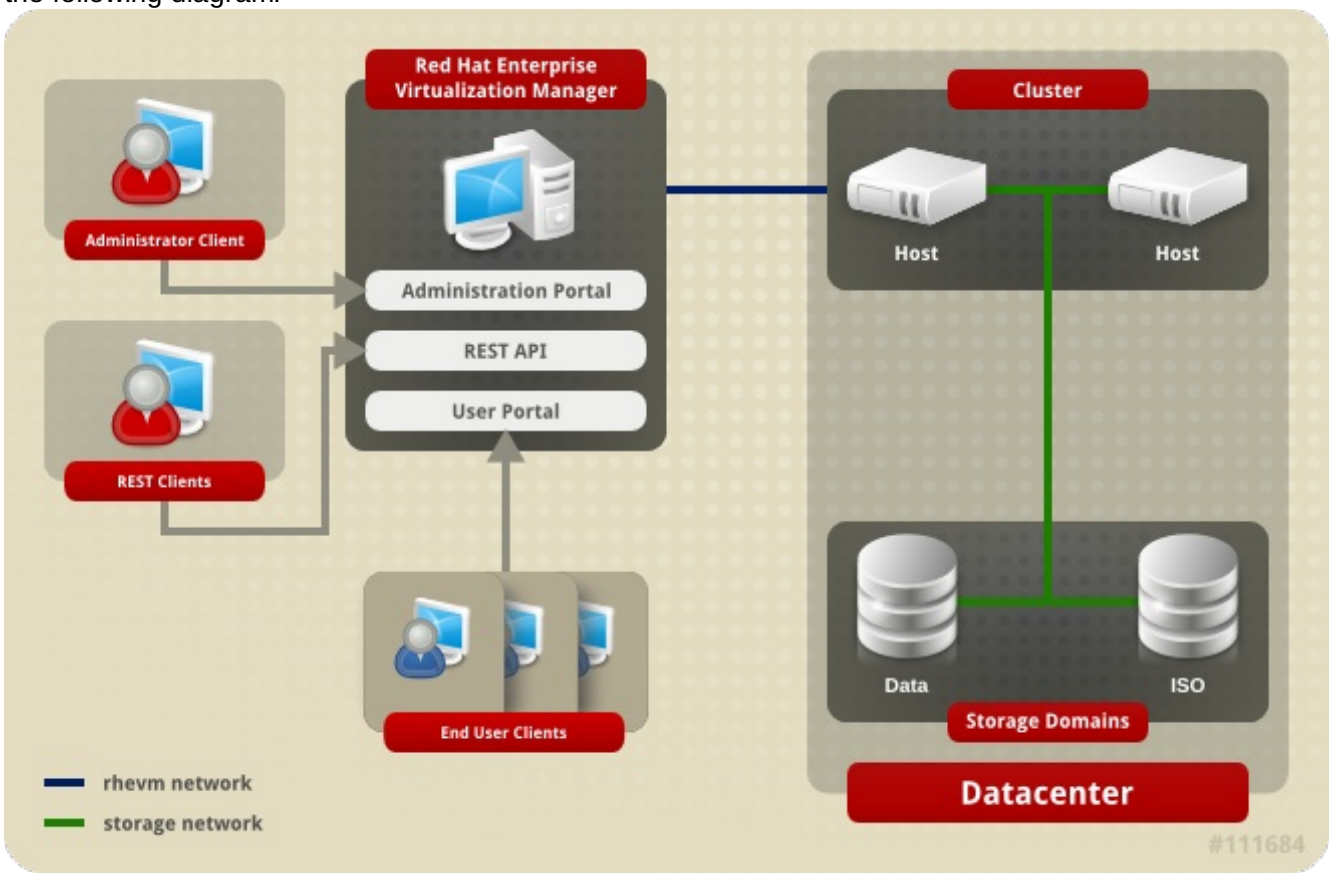

Figure 1.1. Overview of Red Hat Enterprise Virtualization components

1.1. Prerequisites

The following requirements are typical for small- to medium-sized installations. Note that the exact requirements of the setup depend on the specific installation, sizing and load. Please use the following requirements as guidelines:

Red Hat Enterprise Virtualization Manager

- Minimum - Dual core server with 4 GB RAM, with 25 GB free disk space and 1 Gbps network interface.
- Recommended - Dual Sockets/Quad core server with 16 GB RAM, 50 GB free disk space on multiple disk spindles and 1 Gbps network interface.

  The breakdown of the server requirements are as below:
  - For the Red Hat Enterprise Linux 6 operating system: minimum 1 GB RAM and 5 GB local disk space.
  - For the Manager: minimum 3 GB RAM, 3 GB local disk space and 1 Gbps network controller bandwidth.
  - If you wish to create an ISO domain on the Manager server, you need minimum 15 GB disk space.

Important — Supported Locales

The Red Hat Enterprise Virtualization Manager setup script, **rhevm-setup**, supports the **en_US.UTF-8**, **en_US.utf8**, and **en_US.utf-8** locales. Ensure that you install the Red Hat Enterprise Virtualization Manager on a system where the locale in use is one of these supported values.

- A valid Red Hat Network subscription to the following channels:
  - The **Red Hat Enterprise Virtualization Manager (v.3 x86_64)** channel, also referred to as **rhel-x86_64-server-6-rhevm-3**, which provides Red Hat Enterprise Virtualization Manager.
  - The **JBoss Application Platform (v 5) for 6Server x86_64** channel, also referred to as **jbappplatform-5-x86_64-server-6-rpm**, which provides the supported release of the application platform on which the manager runs.
  - The **RHEL Server Supplementary (v. 6 64-bit x86_64)** channel, also referred to as **rhel-x86_64-server-supplementary-6**, which provides the supported version of the Java Runtime Environment (JRE).
- A client for connecting to Red Hat Enterprise Virtualization Manager.
  - Microsoft Windows (7, XP, 2003 or 2008) with Internet Explorer 7 and above
  - Microsoft .NET Framework 4

For each Host (Red Hat Enterprise Virtualization Hypervisor or Red Hat Enterprise Linux)

- Minimum - Dual core server, 10 GB RAM and 10 GB Storage, 1 Gbps network interface.
- Recommended - Dual socket server, 16 GB RAM and 50 GB storage, two 1 Gbps network interfaces.

  The breakdown of the server requirements are as below:
  - For each host: AMD-V or Intel VT enabled, AMD64 or Intel 64 extensions, minimum 1 GB RAM, 3 GB free storage and 1 Gbps network interface.
  - For virtual machines running on each host: minimum 1 GB RAM per virtual machine.
- Valid Red Hat Network subscriptions for each host. You can use either Red Hat Enterprise Virtualization Hypervisor or Red Hat Enterprise Linux hosts, or both.
  - For each Red Hat Enterprise Virtualization Hypervisor host: The **Red Hat Enterprise Virtualization Hypervisor (v.6 x86-64)** channel, also referred to as **rhel-x86_64-server-6-rhevh**.
  - For each Red Hat Enterprise Virtualization Linux host: The **Red Hat Enterprise Virt Management Agent (v 6 x86_64)** channel, also referred to as **rhel-x86_64-rhev-mgmt-agent-6**.

Storage and Networking

- At least one of the supported storage types (NFS, iSCSI and FCP).
  - For NFS storage, a valid IP address and export path is required.
  - For iSCSI storage, a valid IP address and target information is required.
- Static IP addresses for the Red Hat Enterprise Virtualization Manager server and for each host server.
- DNS service which can resolve (forward and reverse) all the IP addresses.
- An existing DHCP server which can allocate network addresses for the virtual machines.

Virtual Machines

- Installation images for creating virtual machines, depending on which operating system you wish to use.
  - Microsoft Windows XP, 7, 2003 or 2008.
  - Red Hat Enterprise Linux 3, 4, 5 or 6.
- Valid licenses or subscription entitlements for each operating system.

Red Hat Enterprise Virtualization User Portal

- A Red Hat Enterprise Linux client running Mozilla Firefox 3.6 and higher or a Windows client running Internet Explorer 7 and higher.

Chapter 2. Install Red Hat Enterprise Virtualization

The Red Hat Enterprise Virtualization platform consists of at least one Manager and one or more hosts.

- **Red Hat Enterprise Virtualization Manager** provides a graphical user interface to manage the physical and logical resources of the Red Hat Enterprise Virtualization infrastructure. The Manager is installed on a Red Hat Enterprise Linux 6 server, and accessed from a Windows client running Internet Explorer.
- **Red Hat Enterprise Virtualization Hypervisor** runs virtual machines. A physical server running Red Hat Enterprise Linux can also be configured as a host for virtual machines on the Red Hat Enterprise Virtualization platform.

2.1. Install Red Hat Enterprise Virtualization Manager

Figure 2.1. Install Red Hat Enterprise Virtualization Manager

The Manager is the control center of the Red Hat Enterprise Virtualization environment. It allows you to define hosts, configure data centers, add storage, define networks, create virtual machines, manage user permissions and use templates from one central location.

The Red Hat Enterprise Virtualization Manager must be installed on a server running Red Hat Enterprise Linux 6, with minimum 4 GB RAM, 25 GB free disk space and 1 Gbps network interface (see Section 1.1, “Prerequisites”).

To install Red Hat Enterprise Virtualization Manager

1. Install Red Hat Enterprise Linux 6 on a server. When prompted for the software packages to install, select the default **`Basic Server`** option. See the *Red Hat Enterprise Linux Installation Guide* for more details.

Important

During installation, remember to set the fully qualified domain name (FQDN) and IP for the server.

2. If the *classpathx-jaf* package has been installed, it must be removed because it conflicts with some of the components required to support JBoss in Red Hat Enterprise Virtualization Manager. Run:

```
# yum remove classpathx-jaf
```

3. If your server has not been registered with the Red Hat Network, run:

```
# rhn_register
```

To complete registration successfully you need to supply your Red Hat Network username and password. Follow the onscreen prompts to complete registration of the system.

After you have registered your server, update all the packages on it. Run:

```
# yum -y update
```

Reboot your server for the updates to be applied.

4. Subscribe the server to the required channels using the Red Hat Network web interface.
   a. Log on to Red Hat Network (http://rhn.redhat.com/).
   b. Click **Systems** at the top of the page.
   c. Select the system to which you are adding channels from the list presented on the screen, by clicking the name of the system.
   d. Click **Alter Channel Subscriptions** in the **Subscribed Channels** section of the screen.
   e. Select the following channels from the list presented on the screen.
      - **Red Hat Enterprise Virtualization Manager (v.3 x86_64)**
      - **RHEL Server Supplementary (v. 6 64-bit x86_64)**
      - **JBoss Application Platform (v 5) for 6Server x86_64** (note that this channel is listed under "Additional Services Channels for Red Hat Enterprise Linux 6 for x86_64")

   Click the **Change Subscription** button to finalize the change.
5. You are now ready to install the Red Hat Enterprise Virtualization Manager. Run the following command:

```
# yum -y install rhevm
```

This command will download the Red Hat Enterprise Virtualization Manager installation software and resolve all dependencies.

6. When the packages have finished downloading, run the installer:

```
# rhevm-setup
```

Important — Supported Locales

rhevm-setup supports the **en_US.UTF-8**, **en_US.utf8**, and **en_US.utf-8** locales. You will not be able to run this installer on a system where the locale in use is not one of these supported values.

7. The installer will take you through a series of interactive questions as listed in the following example. If you do not enter a value when prompted, the installer uses the default settings which are stated in [ ] brackets.

Example 2.1. Red Hat Enterprise Virtualization Manager installation

```
Welcome to RHEV Manager setup utility
HTTP Port  [8080] :
HTTPS Port  [8443] :
Host fully qualified domain name, note that this name should be fully
resolvable  [rhevm.demo.redhat.com] :
Password for Administrator (admin@internal) :
Database password (required for secure authentication with the locally
created database) :
Confirm password :
Organization Name for the Certificate: Red Hat
The default storage type you will be using  ['NFS'| 'FC'| 'ISCSI']  [NFS] :
ISCSI
Should the installer configure NFS share on this server to be used as an ISO
Domain? ['yes'| 'no']  [no] : yes
Mount point path: /data/iso
Display name for the ISO Domain: local-iso-share
Firewall ports need to be opened.
You can let the installer configure iptables automatically overriding the
current configuration. The old configuration will be backed up.
Alternately you can configure the firewall later using an example iptables
file found under /usr/share/rhevm/conf/iptables.example
Configure iptables ? ['yes'| 'no']: yes
```

Important points to note:

- The default ports **8080** and **8443** must be available to access the manager on HTTP and HTTPS respectively.
- If you elect to configure an NFS share it will be exported from the machine on which the manager is being installed.
- The storage type that you select will be used to create a data center and cluster. You will then be able to attach storage to these from the Administration Portal.

8. You are then presented with a summary of the configurations you have selected. Type *yes* to accept them.

Example 2.2. Confirm Manager installation settings

```
RHEV Manager will be installed using the following configuration:
==================================================================
http-port:                      8080
https-port:                     8443
host-fqdn:                      rhevm.demo.redhat.com
auth-pass:                      ********
db-pass:                        ********
org-name:                       Red Hat
default-dc-type:                ISCSI
nfs-mp:                         /data/iso
iso-domain-name:                local-iso-share
override-iptables:              yes
Proceed with the configuration listed above? (yes|no): yes
```

9. The installation commences. The following message displays, indicating that the installation was successful.

Example 2.3. Successful installation

```
Installing:
Creating JBoss Profile...                                  [ DONE ]
Creating CA...                                             [ DONE ]
Setting Database Security...                               [ DONE ]
Creating Database...                                       [ DONE ]
Updating the Default Data Center Storage Type...           [ DONE ]
Editing JBoss Configuration...                             [ DONE ]
Editing RHEV Manager Configuration...                      [ DONE ]
Configuring the Default ISO Domain...                      [ DONE ]
Starting JBoss Service...                                  [ DONE ]
Configuring Firewall (iptables)...                         [ DONE ]

 **** Installation completed successfully ******
```

Your Red Hat Enterprise Virtualization Manager is now up and running. You can log in to the Red Hat Enterprise Virtualization Manager's web administration portal with the username **admin** (the administrative user configured during installation) in the **internal** domain. Instructions to do so are provided at the end of this chapter.

Important

The **internal** domain is automatically created upon installation, however no new users can be added to this domain. To authenticate new users, you need an external directory service. Red Hat Enterprise Virtualization supports IPA and Active Directory, and provides a utility called **rhevm-manage-domains** to attach new directories to the system. Use of this tool is covered in the *Red Hat Enterprise Virtualization Installation Guide*.

2.2. Install Hosts

Figure 2.2. Install Red Hat Enterprise Virtualization Hosts

After you have installed the Red Hat Enterprise Virtualization Manager, install the hosts to run your virtual machines. In Red Hat Enterprise Virtualization, you can use either Red Hat Enterprise Virtualization Hypervisor or Red Hat Enterprise Linux as hosts.

2.2.1. Install Red Hat Enterprise Virtualization Hypervisor

This document provides instructions for installing the Red Hat Enterprise Virtualization Hypervisor using a CD. For alternative methods including PXE networks or USB devices, see the *Red Hat Enterprise Linux Hypervisor Deployment Guide*.

Before installing the Red Hat Enterprise Virtualization Hypervisor, you need to download the hypervisor image from the Red Hat Network and create a bootable CD with the image. This procedure can be performed on any machine running Red Hat Enterprise Linux.

To prepare a Red Hat Enterprise Virtualization Hypervisor installation CD

1. Download the latest version of the *rhev-hypervisor** package from Red Hat Network. The list of hypervisor packages is located at the **`Red Hat Enterprise Virtualization Hypervisor (v.6 x86_64)`** channel.
    a. Log on to Red Hat Network (http://rhn.redhat.com/).
    b. Click **`Systems`** at the top of the page.
    c. From the list presented on the screen, select the system on which the Red Hat Enterprise Virtualization Manager is installed by clicking on its name.
    d. Click **`Alter Channel Subscriptions`** in the **`Subscribed Channels`** section of the screen.
    e. Select the **`Red Hat Enterprise Virtualization Hypervisor (v.6 x86_64)`** channel from the list presented on the screen, then click the **`Change Subscription`** button to finalize the change.

2. Log in to the system on which the Red Hat Enterprise Virtualization Manager is installed. You must log in as the **root** user to install the *rhev-hypervisor* package. Run the following command:

```
# yum install "rhev-hypervisor*"
```

   The hypervisor ISO image is installed into the **/usr/share/rhev-hypervisor/** directory.

3. Insert a blank CD into your CD writer. Use the *cdrecord* utility to burn the hypervisor ISO image onto your disc. Run:

```
# cdrecord dev=/dev/cdrw /usr/share/rhev-hypervisor/rhev-hypervisor.iso
```

You have created a Red Hat Enterprise Virtualization Hypervisor installation CD, now you can use it to boot the machine designated as your hypervisor host. For this guide you will use the interactive installation where you are prompted to configure your settings in a graphical interface. Use the following keys to navigate around the installation screen:

Menu Navigation Keys

- Use the **Up** and **Down** arrow keys to navigate between selections. Your selections are highlighted in white.
- The **Tab** key allows you to move between fields.
- Use the **Spacebar** to tick checkboxes, represented by **[ ]** brackets. A marked checkbox displays with an asterisk (*****).
- To proceed with the selected configurations, press the **Enter** key.

To configure Red Hat Enterprise Virtualization Hypervisor installation settings

1. Insert the Red Hat Enterprise Virtualization Hypervisor 6.2-3.0 installation CD into your CD-ROM drive and reboot the machine. When the boot splash screen displays, press the **Tab** key and select **Boot** to boot from the hypervisor installation media. Press **Enter**.
2. On the installation confirmation screen, select **Install RHEV Hypervisor** and press **Enter**.
3. The installer automatically detects the drives attached to the system. The selected disk for booting the hypervisor is highlighted in white. Ensure that the local disk is highlighted, otherwise use the arrow keys to select the correct disk. Select **Continue** and press **Enter**.
4. You are prompted to confirm your selection of the local drive, which is marked with an asterisk. Select **Continue** and press **Enter**.
5. Enter a password for local console access and confirm it. Select **Install** and press **Enter**. The Red Hat Enterprise Virtualization Hypervisor partitions the local drive, then commences installation.
6. Once installation is complete, a dialog prompts you to **Reboot** the hypervisor. Press **Enter** to confirm. Remove the installation disc.
7. After the hypervisor has rebooted, you will be taken to a login shell. Log in as the **admin** user with the password you provided during installation to enter the Red Hat Enterprise Virtualization Hypervisor management console.
8. On the hypervisor management console, there are eight tabs on the left. Press the **Up** and **Down** keys to navigate between the tabs and **Enter** to access them.
    a. Select the **Network** tab. Configure the following options:
        - **Hostname**: Enter the hostname in the format of **hostname.domain.example.com**.
        - **DNS Server**: Enter the Domain Name Server address in the format of **192.168.0.254**. You can use up to two DNS servers.

- **NTP Server**: Enter the Network Time Protocol server address in the format of **rhel.pool.ntp.org**. This synchronizes the hypervisor's system clock with that of the manager's. You can use up to two NTP servers. Select **Apply** and press **Enter** to save your network settings.
- The installer automatically detects the available network interface devices to be used as the management network. Select the device and press **Enter** to access the interface configuration menu. Under **IPv4 Settings**, tick either the **DHCP** or **Static** checkbox. If you are using static IPv4 network configuration, fill in the **IP Address**, **Netmask** and **Gateway** fields.

To confirm your network settings, select **OK** and press **Enter**.

b. Select the **RHEV-M** tab. Configure the following options:
   - **Management Server**: Enter the Red Hat Enterprise Virtualization Manager domain name in the format of **rhevm.demo.redhat.com**.
   - **Management Server Port**: Enter the management server port number. The default is **8443**.
   - **Connect to the RHEV Manager and Validate Certificate**: Tick this checkbox if you wish to verify the RHEVM security certificate.
   - **Set RHEV-M Admin Password**: This field allows you to specify the root password for the hypervisor, and enable SSH password authentication from the Red Hat Enterprise Virtualization Manager. This field is optional, and is covered in more detail in the *Red Hat Enterprise Virtualization Installation Guide*.

   Select **Apply** and press **Enter**. A dialog displays, asking you to connect the hypervisor to the Red Hat Enterprise Virtualization Manager and validate its certificate. Select **Approve** and press **Enter**. A message will display notifying you that the manager configuration has been successfully updated.

c. Under the **Red Hat Network** tab, you can register the host with the Red Hat Network. This enables the host to run Red Hat Enterprise Linux virtual machines with proper RHN entitlements. Configure the following settings:
   - Enter your Red Hat Network credentials in the **Login** and **Password** fields.
   - To select the method by which the hypervisor receives updates, tick either the **RHN** or **Satellite** checkboxes. Fill in the **RHN URL** and **RHN CA** fields.

   To confirm your RHN settings, select **Apply** and press **Enter**.

d. Accept all other default settings. For information on configuring security, logging, kdump and remote storage, refer to the *Red Hat Enterprise Linux 6 Hypervisor Deployment Guide*.

e. Finally, select the **Status** tab. Select **Restart** and press **Enter** to reboot the host and apply all changes.

You have now successfully installed the Red Hat Enterprise Virtualization Hypervisor. Repeat this procedure if you wish to use more hypervisors. The following sections will provide instructions on how to approve the hypervisors for use with the Red Hat Enterprise Virtualization Manager.

2.2.2. Install Red Hat Enterprise Linux Host

You now know how to install a Red Hat Enterprise Virtualization Hypervisor. In addition to hypervisor hosts, you can also reconfigure servers which are running Red Hat Enterprise Linux to be used as virtual machine hosts.

To install a Red Hat Enterprise Linux 6 host

1. On the machine designated as your Red Hat Enterprise Linux host, install Red Hat Enterprise Linux 6.2. Select only the Base package group during installation. For more comprehensive

instructions, refer to the *Red Hat Enterprise Linux Installation Guide*.

2. If your server has not been registered with the Red Hat Network, run the **rhn_register** command as **root** to register it. To complete registration successfully you will need to supply your Red Hat Network username and password. Follow the onscreen prompts to complete registration of the system.

```
# rhn_register
```

3. Subscribe the server to the required channels using the Red Hat Network web interface.
   a. Log on to Red Hat Network (http://rhn.redhat.com/).
   b. Click **Systems** at the top of the page.
   c. Select the system to which you are adding channels from the list presented on the screen, by clicking the name of the system.
   d. Click **Alter Channel Subscriptions** in the **Subscribed Channels** section of the screen.
   e. Select the **Red Hat Enterprise Virt Management Agent (v 6 x86_64)** channel from the list presented on the screen, then click the **Change Subscription** button to finalize the change.
4. Red Hat Enterprise Virtualization platform uses a number of network ports for management and other virtualization features. Adjust your Red Hat Enterprise Linux host's firewall settings to allow access to the required ports by configuring **iptables** rules. Modify the **/etc/sysconfig/iptables** file so it resembles the following example:

```
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [10765:598664]
-A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
-A INPUT -p tcp --dport 22 -j ACCEPT
-A INPUT -p tcp --dport 16514 -j ACCEPT
-A INPUT -p tcp --dport 54321 -j ACCEPT
-A INPUT -p tcp -m multiport --dports 5634:6166 -j ACCEPT
-A INPUT -p tcp -m multiport --dports 49152:49216 -j ACCEPT
-A INPUT -p tcp -m state --state NEW
-A INPUT -j REJECT --reject-with icmp-host-prohibited
-A FORWARD -m physdev ! --physdev-is-bridged -j REJECT --reject-with icmp-
host-prohibited
COMMIT
```

5. Ensure that the **iptables** service is configured to start on boot and has been restarted, or started for the first time if it was not already running. Run the following commands:

```
# chkconfig iptables on
# service iptables restart
```

You have now successfully installed a Red Hat Enterprise Linux host. As before, repeat this procedure if you wish to use more Linux hosts. Before you can start running virtual machines on your host, you have to manually add it to the Red Hat Enterprise Virtualization Manager via the administration portal, which you will access in the next step.

Figure 2.3. Connect to the Manager administration portal

Now that you have installed the Red Hat Enterprise Virtualization Manager and hosts, you can log in to the Manager administration portal to start configuring your virtualization environment. The web-based administration portal can be accessed using a Windows client running Internet Explorer.

Before logging in, install .NET Framework 4 and modify the default security settings on the machine used to access the web administration portal. The example below is applicable for Windows 2008.

To configure Windows client to access the administration portal

1. To install .NET Framework 4, download it from http://www.microsoft.com/download/en/details.aspx?id=17718. Run this executable as a user with administration access to the system.
2. Next, disable Internet Explorer Enhanced Security Configuration. Click **Start → Administrative Tools → Server Manager**. On the **Security Information** pane in the **Server Manager** window, click **Configure IE ESC**. Select **Off** for Administrators and Users to disable the security configuration. Click **OK**.
3. To add the administration portal to the browser's list of trusted sites, open a browser and click on **Tools → Internet Options**. Click on the **Security** tab.
    a. Select **Trusted Sites**. Click **Sites** to display the **Trusted Sites** dialog. Enter the URL for your administration portal in the **Add this website to the zone** textbox. Click **Add**, then **Close**.
    b. Click the **Custom Level...** button. Locate the **XAML browser applications** item in the list, ensure that it is set to **Enable**, then click **OK**.
4. Restart Internet Explorer to access the administration portal.

2.3.1. Log In to Administration Portal

Now that the prerequisites have been resolved, you can log in to the Red Hat Enterprise Virtualization Manager administration portal. Ensure that you have the administrator password configured during installation as instructed in Example 2.1, "Red Hat Enterprise Virtualization Manager installation".

To connect to Red Hat Enterprise Virtualization web management portal

1. Open a browser and navigate to **`https://domain.example.com:8443/RHEVManager`**. Substitute **`domain.example.com`** with the URL provided during installation.
2. If this is your first time connecting to the administration portal, Red Hat Enterprise Virtualization Manager will issue security certificates for your browser. Click the link labelled **`this certificate`** to trust the **`ca.cer`** certificate. A pop-up displays, click **`Open`** to launch the **`Certificate`** dialog. Click **`Install Certificate`** and select to place the certificate in **`Trusted Root Certification Authorities`** store.
3. Back on the browser screen, click the link labelled **`here`** and follow the prompts to install the **`RHEV-GUI-CertificateInstaller`** executable. A pop-up displays again, this time click **`Run`**. Note that the actual certificate installation is preceded by an ActiveX installation.

   When complete, a new link labelled **`here`** appears. Click on it to reload the administration portal.
4. The portal login screen displays. Enter **`admin`** as your **`User Name`**, and enter the **`Password`** that you provided during installation. Ensure that your domain is set to **`Internal`**. Click **`Login`**.

You have now successfully logged in to the Red Hat Enterprise Virtualization web administration portal. Here, you can configure and manage all your virtual resources. The functions of the Red Hat Enterprise Virtualization Manager graphical user interface are described in the following figure and list:

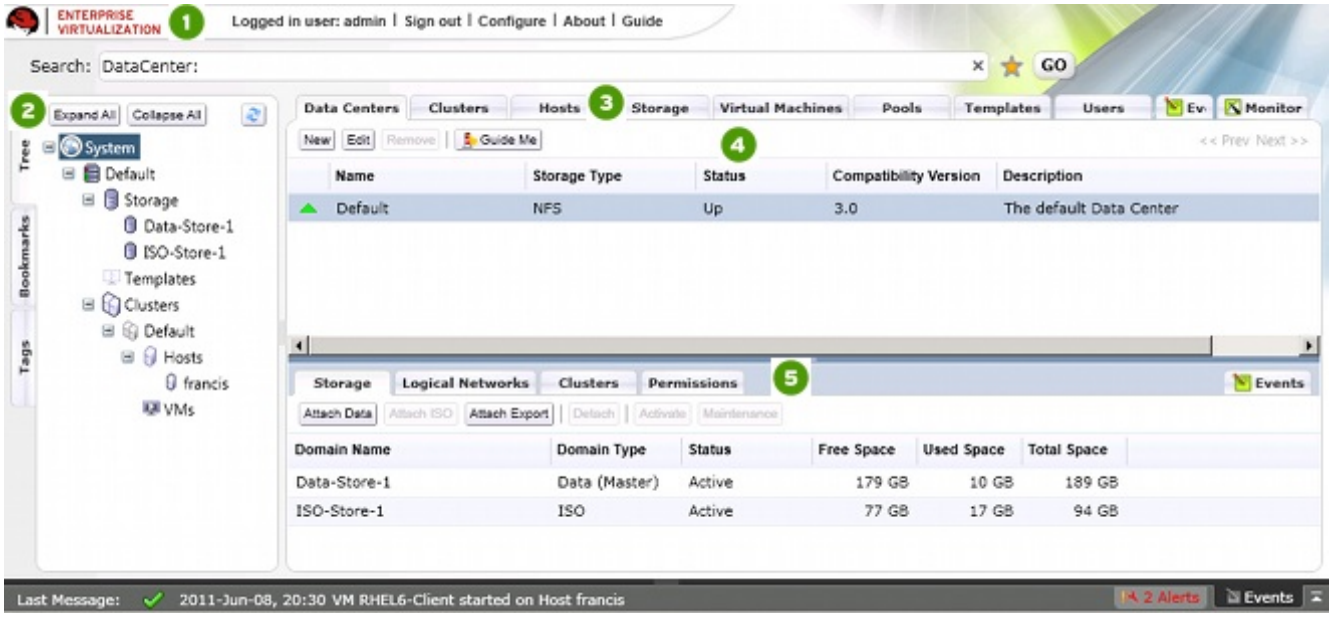

Figure 2.4. Administration Portal Features

1. **`Header`**: This bar contains the name of the logged in user, the sign out button, the option to configure user roles.
2. **`Navigation Pane`**: This pane allows you to navigate between the Tree, Bookmarks and Tags tabs. In the Tree tab, tree mode allows you to see the entire system tree and provides a visual representation your virtualization environment's architecture.

3. **Resources Tabs**: These tabs allow you to access the resources of Red Hat Enterprise Virtualization. You should already have a Default Data Center, a Default Cluster, a Host waiting to be approved, and available Storage waiting to be attached to the data center.
4. **Results List**: When you select a tab, this list displays the available resources. You can perform a task on an individual item or multiple items by selecting the item(s) and then clicking the relevant action button. If an action is not possible, the button is disabled.
5. **Details Pane**: When you select a resource, this pane displays its details in several subtabs. These subtabs also contain action buttons which you can use to make changes to the selected resource.

Once you are familiar with the layout of the administration portal, you can start configuring your virtual environment.

Chapter 3. Configure Red Hat Enterprise Virtualization

Now that you have logged in to the administration portal, configure your Red Hat Enterprise Virtualization environment by defining the data center, host cluster, networks and storage. Even though this guide makes use of the default resources configured during installation, if you are setting up a Red Hat Enterprise Virtualization environment with completely new components, you should perform the configuration procedure in the sequence given here.

3.1. Configure Data Centers

Figure 3.1. Configure Data Center

A data center is a logical entity that defines the set of physical and logical resources used in a managed virtual environment. Think of it as a container which houses clusters of hosts, virtual machines, storage and networks.

By default, Red Hat Enterprise Virtualization creates a data center at installation. Its type is configured from the installation script. To access it, navigate to the **Tree** pane, click **Expand All**, and select the **Default** data center. On the **Data Centers** tab, the **Default** data center displays.

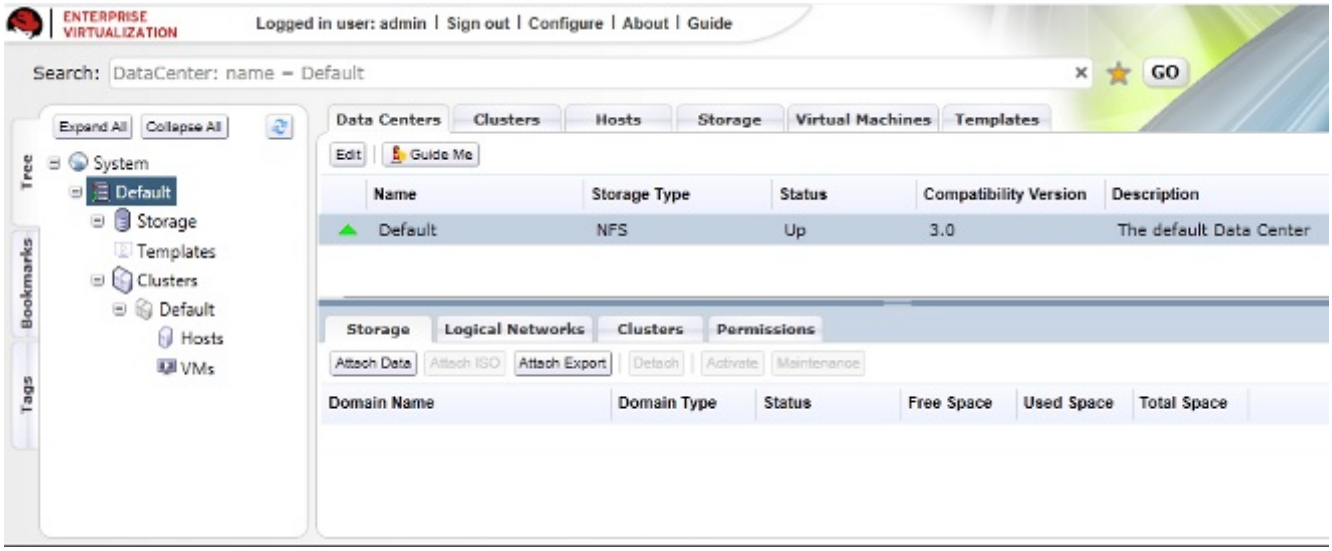

Figure 3.2. Data Centers Tab

The **`Default`** data center is used for this document, however if you wish to create a new data center see the *Red Hat Enterprise Virtualization Administration Guide*.

3.2. Configure Cluster

Figure 3.3. Populate Cluster with Hosts

A cluster is a set of physical hosts that are treated as a resource pool for a set of virtual machines. Hosts in a cluster share the same network infrastructure, the same storage and the same type of CPU. They constitute a migration domain within which virtual machines can be moved from host to host.

By default, Red Hat Enterprise Virtualization creates a cluster at installation. To access it, navigate to the **`Tree`** pane, click **`Expand All`** and select the **`Default`** cluster. On the **`Clusters`** tab, the **`Default`**

cluster displays.

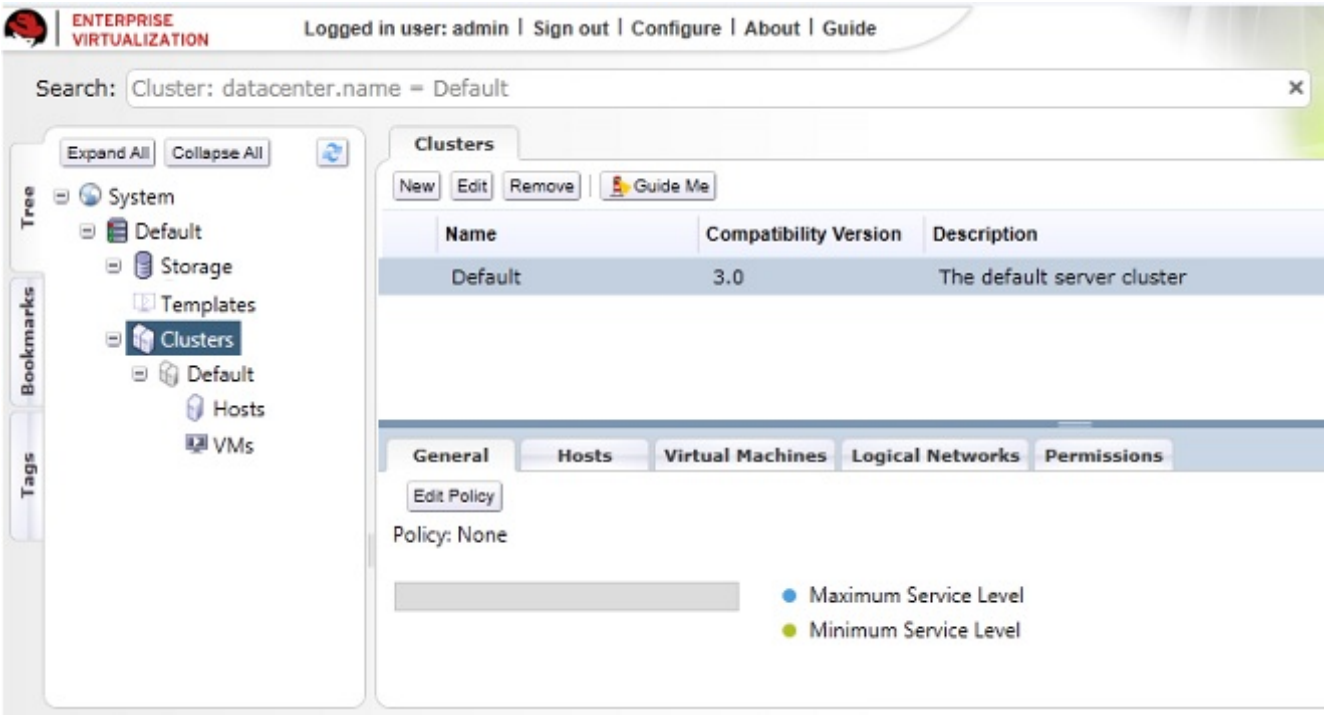

Figure 3.4. Clusters Tab

For this document, the Red Hat Enterprise Virtualization Hypervisor and Red Hat Enterprise Linux hosts will be attached to the **`Default`** host cluster. If you wish to create new clusters, or live migrate virtual machines between hosts in a cluster, see the *Red Hat Enterprise Virtualization Evaluation Guide*.

3.3. Configure Networking

Figure 3.5. Configure Networking

At installation, Red Hat Enterprise Virtualization defines a Management network for the default data center. This network is used for communication between the manager and the host. New logical networks - for example for guest data, storage or display - can be added to enhance network speed and performance. All networks used by hosts and clusters must be added to data center they belong to.

To access the Management network, click on the **Clusters** tab and select the default cluster. Click the **Logical Networks** tab in the Details pane. The **rhevm** network displays.

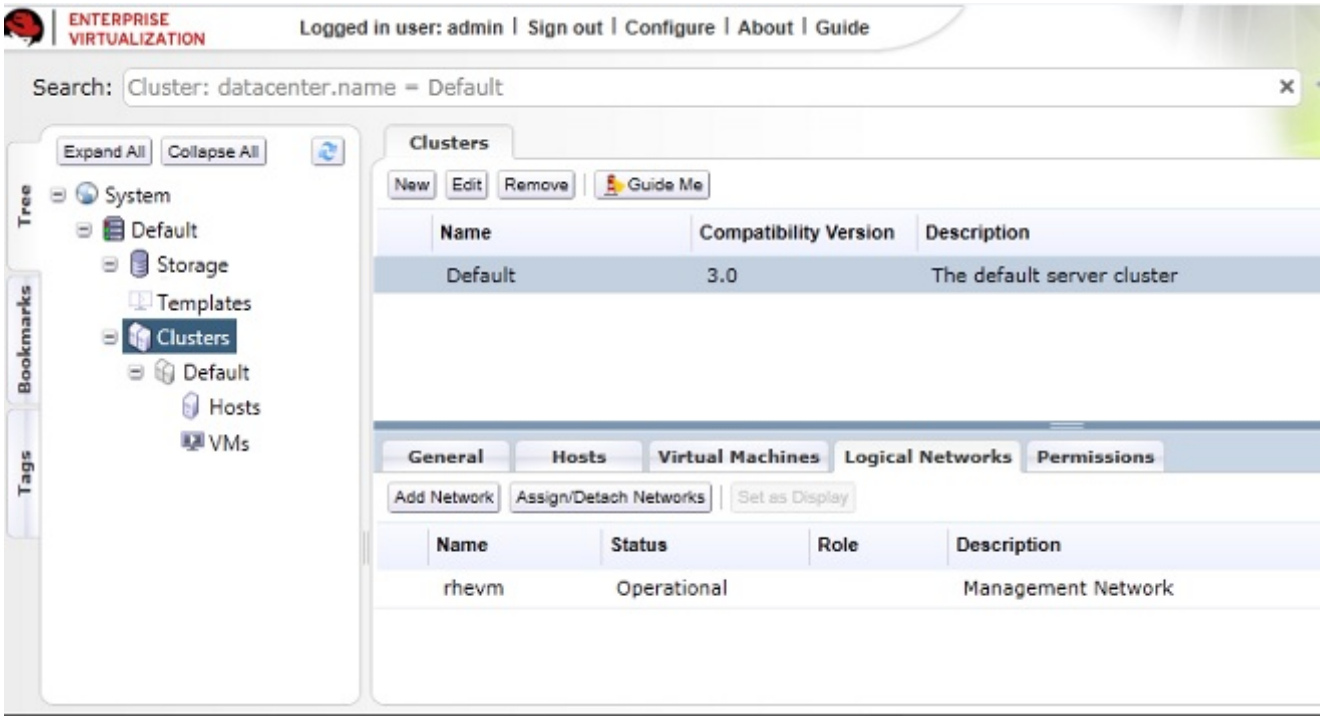

Figure 3.6. Logical Networks Tab

The **rhevm** Management network is used for this document, however if you wish to create new logical networks see the *Red Hat Enterprise Virtualization Administration Guide*.

3.4. Configure Hosts

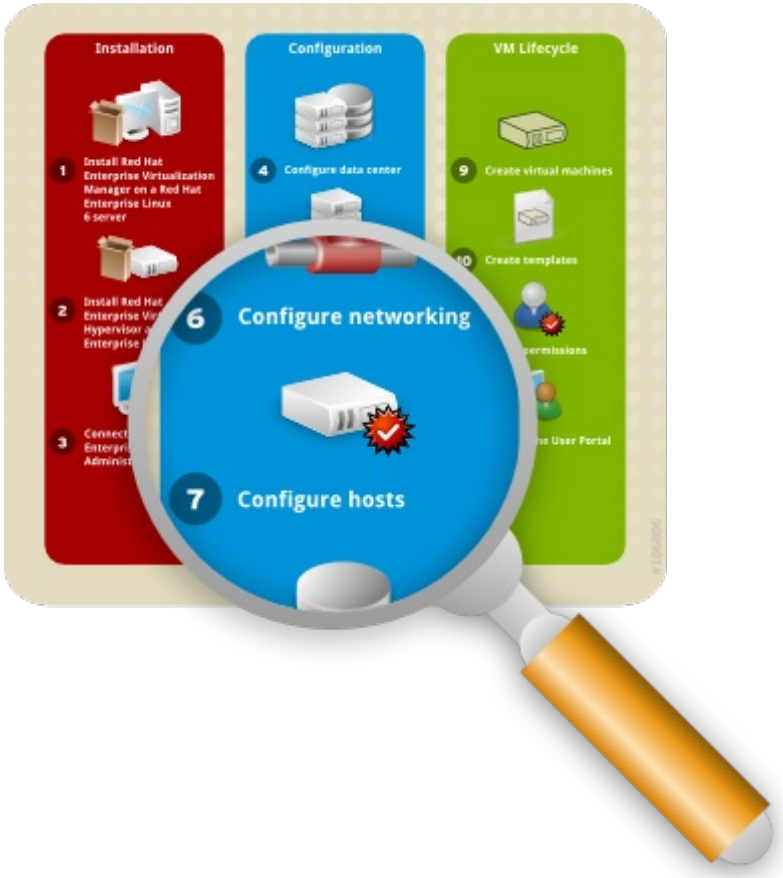

Figure 3.7. Configure Hosts

You have already installed your Red Hat Enterprise Virtualization Hypervisor and Red Hat Enterprise Linux hosts, but before they can be used, they have to be added to the Manager. The Red Hat Enterprise Virtualization Hypervisor is specifically designed for the Red Hat Enterprise Virtualization platform, therefore it only needs a simple click of approval. Conversely, Red Hat Enterprise Linux is a general purpose operating system, therefore reprogramming it as a host requires additional configuration.

3.4.1. Approve Red Hat Enterprise Virtualization Hypervisor Host

The Hypervisor you installed in Section 2.2.1, “Install Red Hat Enterprise Virtualization Hypervisor” is automatically registered with the Red Hat Enterprise Virtualization platform. It displays in the Red Hat Enterprise Virtualization Manager, and needs to be approved for use.

To set up a Red Hat Enterprise Virtualization Hypervisor host

1. On the **Tree** pane, click **Expand All** and select **Hosts** under the Default cluster. On the **Hosts** tab, select the name of your newly installed hypervisor.

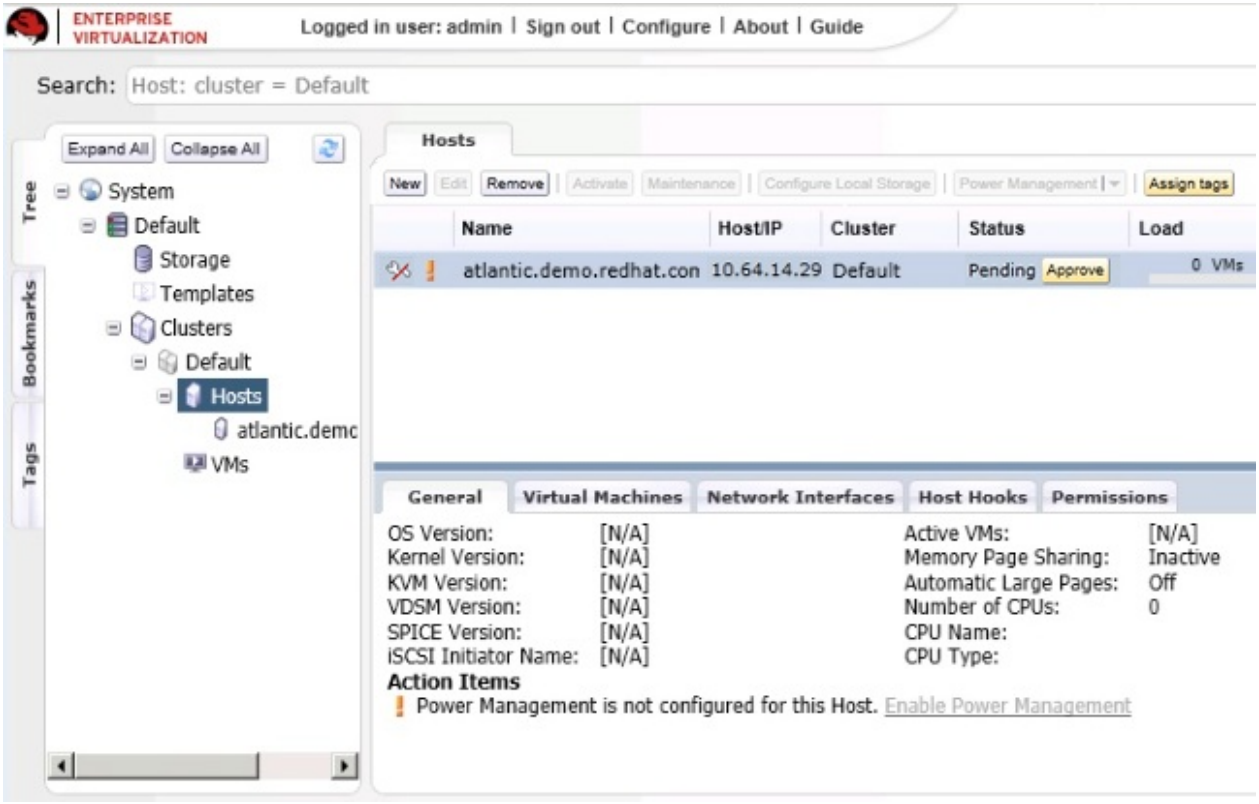

Figure 3.8. Red Hat Enterprise Virtualization Hypervisor pending approval

2. Click the **Approve** button. The **Edit and Approve Host** dialog displays. Accept the defaults or make changes as necessary, then click **OK**.

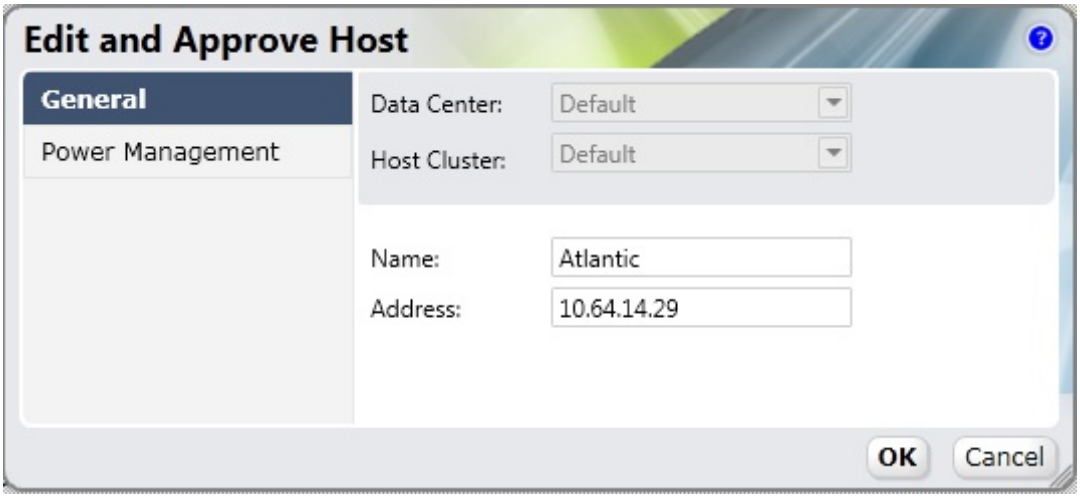

Figure 3.9. Approve Red Hat Enterprise Virtualization Hypervisor

3. The host status will change from **Non Operational** to **Up**.

3.4.2. Attach Red Hat Enterprise Linux Host

In contrast to the hypervisor host, the Red Hat Enterprise Linux host you installed in Section 2.2.2, "Install Red Hat Enterprise Linux Host" is not automatically detected. It has to be manually attached to the Red Hat Enterprise Virtualization platform before it can be used.

To attach a Red Hat Enterprise Linux host

1. On the **Tree** pane, click **Expand All** and select **Hosts** under the Default cluster. On the **Hosts** tab, click **New**.
2. The **New Host** dialog displays.

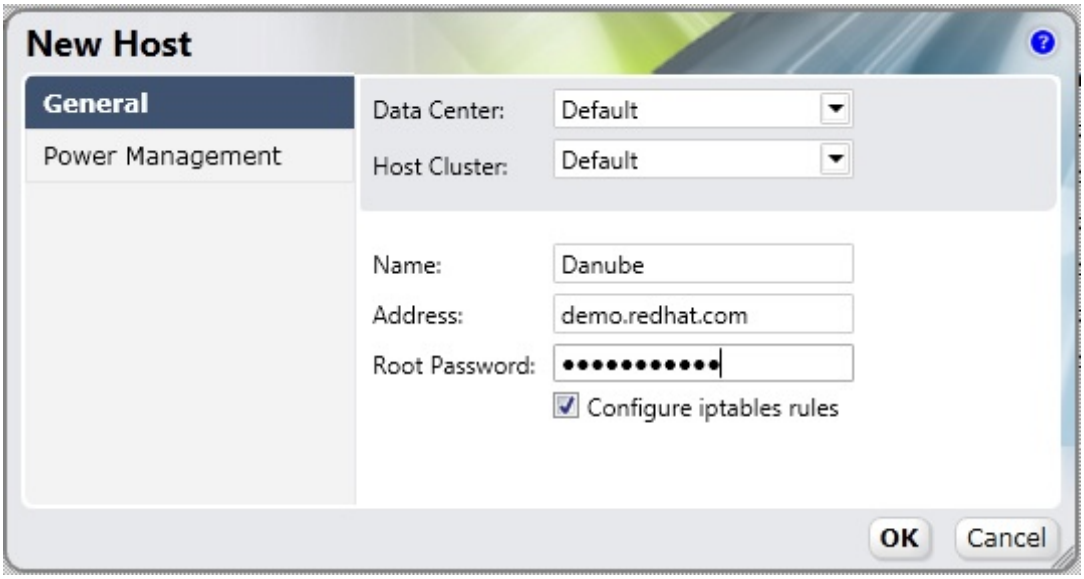

Figure 3.10. Attach Red Hat Enterprise Linux Host

Enter the details in the following fields:

- **Data Center**: the data center to which the host belongs. Select the **Default** data center.
- **Host Cluster**: the cluster to which the host belongs. Select the **Default** cluster.
- **Name**: a descriptive name for the host.
- **Address**: the IP address, or resolvable hostname of the host, which was provided during installation.
- **Root Password**: the password of the designated host; used during installation of the host.
- **Configure iptables rules**: This checkbox allows you to override the firewall settings on the host with the default rules for Red Hat Enterprise Virtualization.

3. If you wish to configure this host for Out of Band (OOB) power management, select the **Power Management** tab. Tick the **Enable Power Management** checkbox and provide the required information in the following fields:
   - **Address**: The address of the host.
   - **User Name**: A valid user name for the OOB management.
   - **Password**: A valid, robust password for the OOB management.
   - **Type**: The type of OOB management device. Select the appropriate device from the drop down list.

alom	Sun Advanced Lights Out Manager
apc	American Power Conversion Master MasterSwitch network power switch
bladecenter	IBM Bladecentre Remote Supervisor Adapter
drac5	Dell Remote Access Controller for Dell computers
eps	ePowerSwitch 8M+ network power switch
ilo	HP Integrated Lights Out standard
ilo3	HP Integrated Lights Out 3 standard

ipmilan	Intelligent Platform Management Interface
rsa	IBM Remote Supervisor Adaptor
rsb	Fujitsu-Siemens RSB management interface
wti	Western Telematic Inc Network PowerSwitch
cisco_ucs	Cisco Unified Computing System Integrated Management Controller

- **Options**: Extra command line options for the fence agent. Detailed documentation of the options available is provided in the man page for each fence agent.

Click the **Test** button to test the operation of the OOB management solution.

If you do not wish to configure power management, leave the **Enable Power Management** checkbox unmarked.

4. Click **OK**. If you have not configured power management, a pop-up window prompts you to confirm if you wish to proceed without power management. Select **OK** to continue.
5. The new host displays in the list of hosts with a status of *Installing*. Once installation is complete, the status will update to *Reboot* and then *Awaiting*. When the host is ready for use, its status changes to **Up**.

You have now successfully configured your hosts to run virtual machines. The next step is to prepare data storage domains to house virtual machine disk images.

3.5. Configure Storage

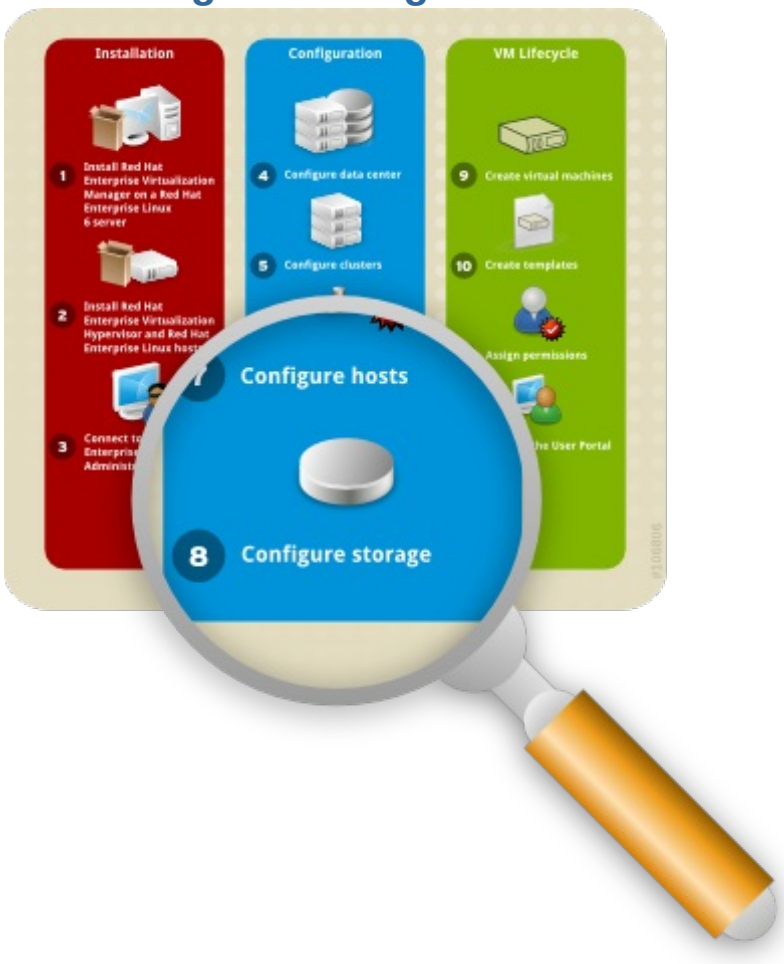

Figure 3.11. Configure Storage

After configuring your logical networks, you need to add storage to your data center.

Red Hat Enterprise Virtualization uses a centralized shared storage system for virtual machine disk images and snapshots. Storage can be implemented using Network File System (NFS), Internet Small Computer System Interface (iSCSI) or Fibre Channel Protocol (FCP). Storage definition, type and function, are encapsulated in a logical entity called a **Storage Domain**. Multiple storage domains are supported. For more information on storage types refer to the *Red Hat Enterprise Linux Storage Administration Guide*.

For this guide you will use two types of storage domains. The first is an NFS share for ISO images of installation media. You have already created this ISO domain during the Red Hat Enterprise Virtualization Manager installation.

The second storage domain will be used to hold virtual machine disk images. For this domain, you need at least one of the supported storage types. You have already set a default storage type during installation as described in Section 2.1, “Install Red Hat Enterprise Virtualization Manager”. Ensure that you use the same type when creating your data domain.

Select your next step by checking the storage type you should use:

1. Navigate to the **Tree** pane and click the **Expand All** button. Under System, click **Default**. On the results list, the **Default** data center displays.
2. On the results list, the **Storage Type** column displays the type you should add.
3. Now that you have verified the storage type, create the storage domain:
   - For NFS storage, refer to Section 3.5.1, “Create an NFS Data Domain”.
   - For iSCSI storage, refer to Section 3.5.2, “Create an iSCSI Data Domain”.
   - For FCP storage, refer to Section 3.5.3, “Create an FCP Data Domain”.

Note

This document provides instructions to create a single storage domain, which is automatically attached and activated in the selected data center. If you wish to create additional storage domains within one data center, see the *Red Hat Enterprise Virtualization Administration Guide* for instructions on activating storage domains.

3.5.1. Create an NFS Data Domain

Because you have selected NFS as your default storage type during the Manager installation, you will now create an NFS storage domain. An NFS type storage domain is a mounted NFS share that is attached to a data center and used to provide storage for virtual machine disk images.

Important

If you are using NFS storage, you must first create and export the directories to be used as storage domains from the NFS server. These directories must have their numerical user and group ownership set to 36:36 on the NFS server, to correspond to the vdsm user and kvm group respectively on the Red Hat Enterprise Virtualization Manager server. In addition, these directories must be exported with the read write options (rw). For more information see the *Red Hat Enterprise Virtualization Installation Guide*.

To add NFS storage:

1. Navigate to the **Tree** pane and click the **Expand All** button. Under System, select the **Default** data center and click on **Storage**. The available storage domains display on the results list. Click **New Domain**.
2. The **New Storage** dialog box displays.

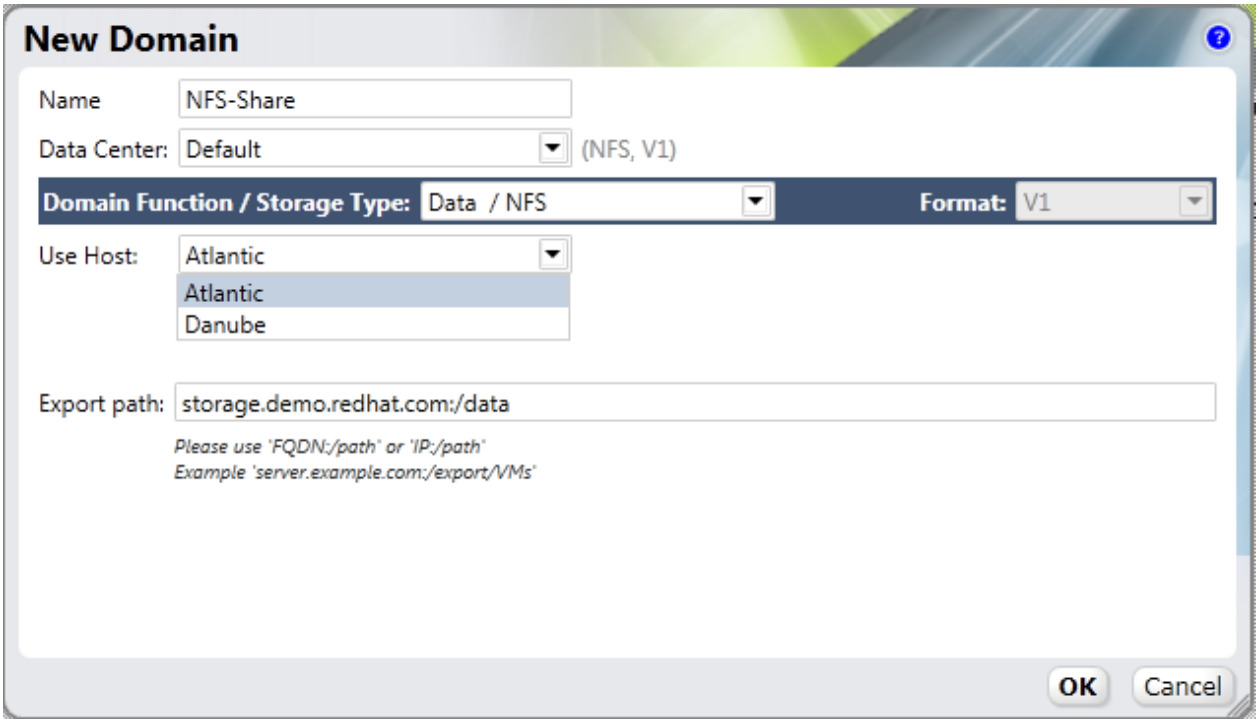

Figure 3.12. Add New Storage

Configure the following options:

a. **Name**: Enter a suitably descriptive name.

b. **Data Center**: The **Default** data center is already pre-selected.

c. **Domain Function / Storage Type**: In the drop down menu, select **Data → NFS**. The storage domain types not compatible with the Default data center are grayed out. After you select your domain type, the **Export Path** field appears.

d. **Use Host**: Select any of the hosts from the drop down menu. Only hosts which belong in the pre-selected data center will display in this list.

e. **Export path**: Enter the IP address or a resolvable hostname of the chosen host. The export path should be in the format of **192.168.0.10:/data** or **domain.example.com:/data**

3. Click **OK**. The new NFS data domain displays on the Storage tab. It will remain with a *Locked* status while it is being prepared for use. When ready, it is automatically attached to the data center.

You have created an NFS storage domain. Now, you need to attach an ISO domain to the data center and upload installation images so you can use them to create virtual machines. Proceed to Section 3.5.4, "Attach and Populate ISO domain".

3.5.2. Create an iSCSI Data Domain

Because you have selected iSCSI as your default storage type during the Manager installation, you will

now create an iSCSI storage domain. Red Hat Enterprise Virtualization platform supports iSCSI storage domains spanning multiple pre-defined Logical Unit Numbers (LUNs).

To add iSCSI storage:

1. On the side pane, select the **Tree** tab. On **System**, click the **+** icon to display the available data centers.
2. Double click on the **Default** data center and click on **Storage**. The available storage domains display on the results list. Click **New Domain**.
3. The **New Domain** dialog box displays.

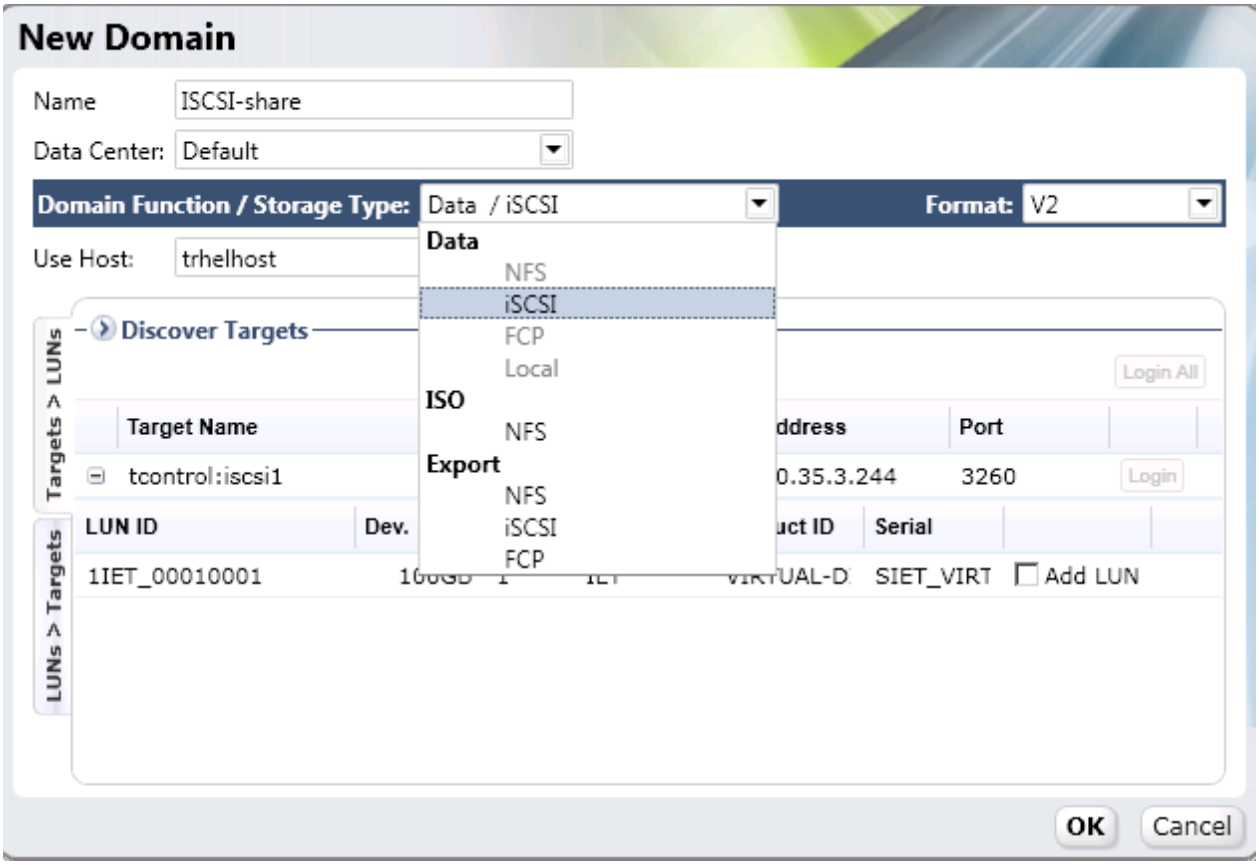

Figure 3.13. Add iSCSI Storage

Configure the following options:

a. **Name**: Enter a suitably descriptive name.

b. **Data Center**: The **Default** data center is already pre-selected.

c. **Domain Function / Storage Type**: In the drop down menu, select **Data → iSCSI**. The storage domain types which are not compatible with the Default data center are grayed out. After you select your domain type, the **Use Host** and **Discover Targets** fields display.

d. **Use host**: Select any of the hosts from the drop down menu. Only hosts which belong in this data center will display in this list.

4. To connect to the iSCSI target, click the **Discover Targets** bar. This expands the menu to display further connection information fields.

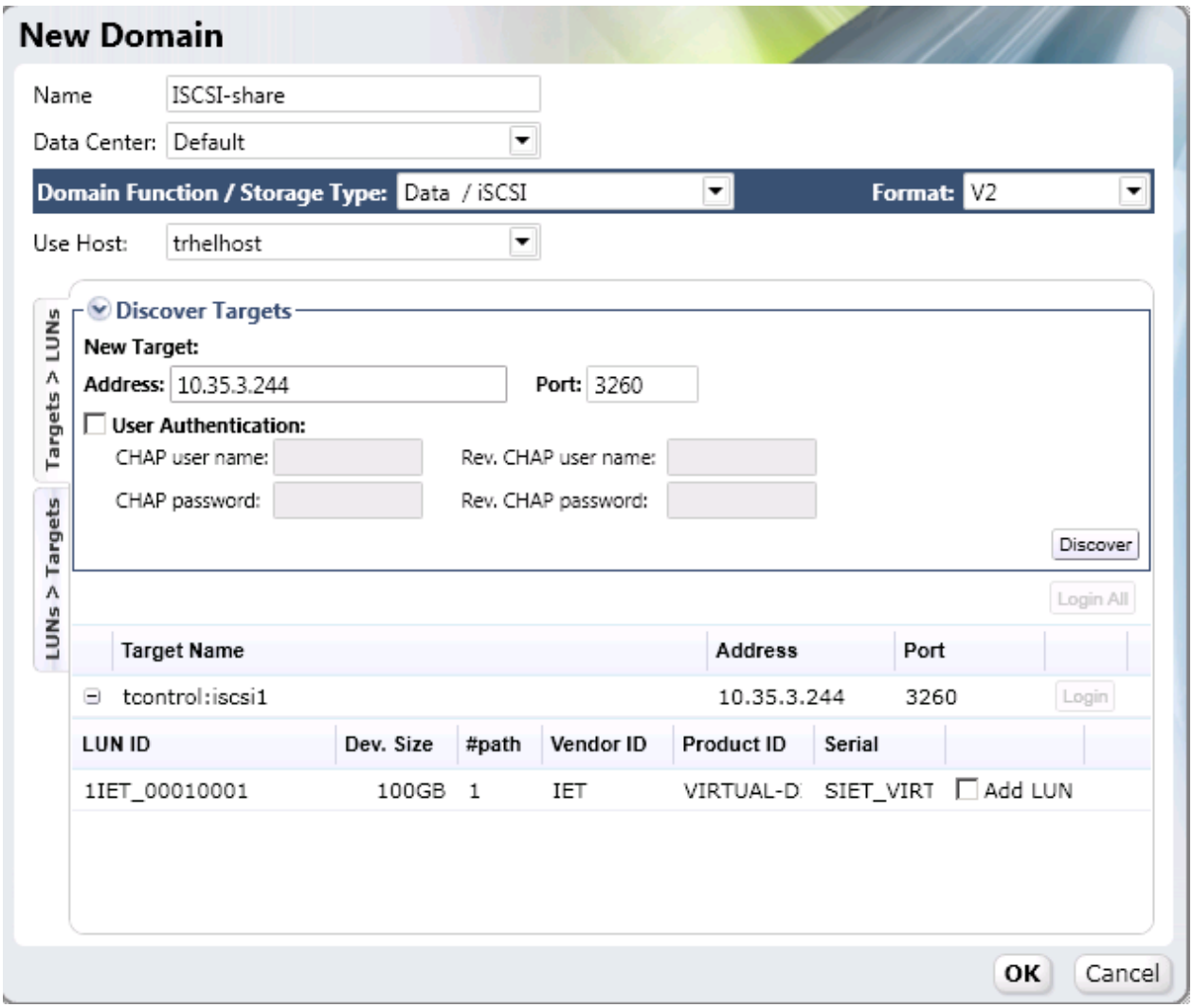

Figure 3.14. Attach LUNs to iSCSI domain

Enter the required information:

a. **`Address`**: Enter the address of the iSCSI target.

b. **`Port`**: Select the port to connect to. The default is 3260.

c. **`User Authentication`**: If required, enter the username and password.

5. Click the **`Discover`** button to find the targets. The iSCSI targets display in the results list with a **`Login`** button for each target.
6. Click **`Login`** to display the list of existing LUNs. Tick the **`Add LUN`** checkbox to use the selected LUN as the iSCSI data domain.
7. Click **`OK`**. The new NFS data domain displays on the Storage tab. It will remain with a *Locked* status while it is being prepared for use. When ready, it is automatically attached to the data center.

You have created an iSCSI storage domain. Now, you need to attach an ISO domain to the data center and upload installation images so you can use them to create virtual machines. Proceed to Section 3.5.4, "Attach and Populate ISO domain".

3.5.3. Create an FCP Data Domain

Because you have selected FCP as your default storage type during the Manager installation, you will now create an FCP storage domain. Red Hat Enterprise Virtualization platform supports FCP storage

domains spanning multiple pre-defined Logical Unit Numbers (LUNs).

To add FCP storage:

1. On the side pane, select the **Tree** tab. On **System**, click the **+** icon to display the available data centers.
2. Double click on the **Default** data center and click on **Storage**. The available storage domains display on the results list. Click **New Domain**.
3. The **New Domain** dialog box displays.

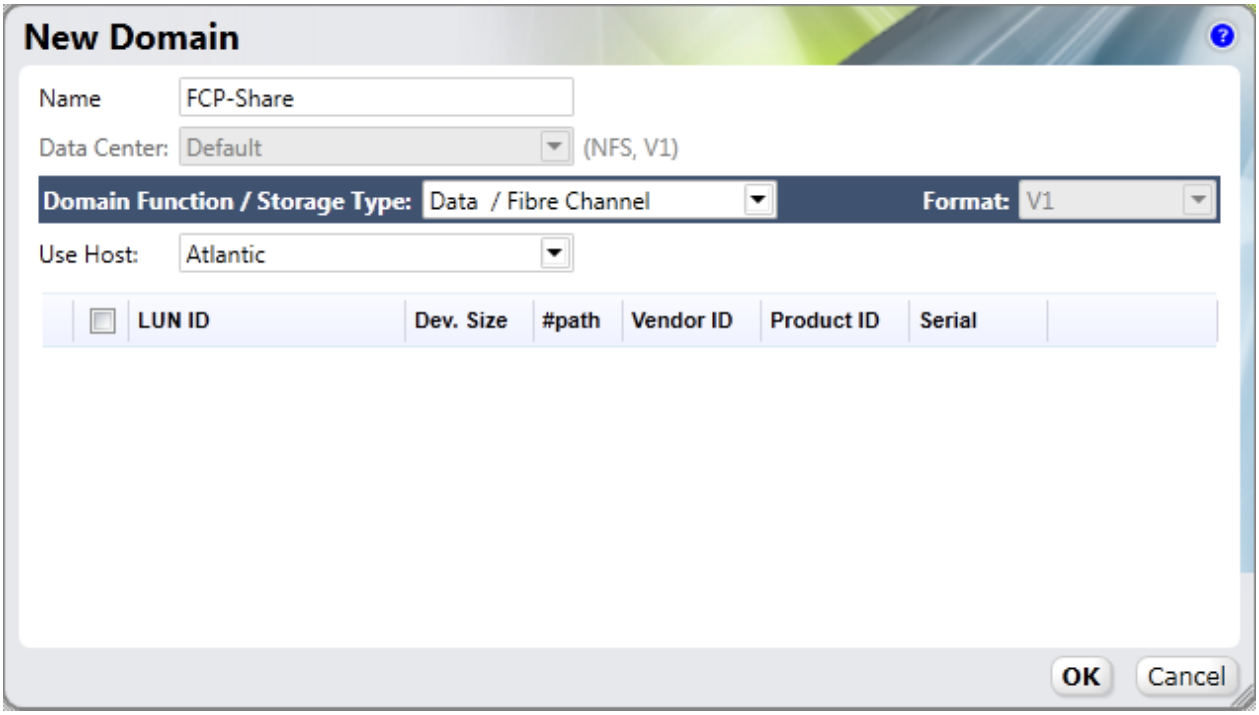

Figure 3.15. Add FCP Storage

Configure the following options:

a. **Name**: Enter a suitably descriptive name.
b. **Data Center**: The **Default** data center is already pre-selected.
c. **Domain Function / Storage Type**: Select **FCP**.
d. **Use Host**: Select the IP address of either the hypervisor or Red Hat Enterprise Linux host.
e. The list of existing LUNs display. On the selected LUN, tick the **Add LUN** checkbox to use it as the FCP data domain.

4. Click **OK**. The new FCP data domain displays on the Storage tab. It will remain with a *Locked* status while it is being prepared for use. When ready, it is automatically attached to the data center.

You have created an FCP storage domain. Now, you need to attach an ISO domain to the data center and upload installation images so you can use them to create virtual machines. Proceed to Section 3.5.4, "Attach and Populate ISO domain".

3.5.4. Attach and Populate ISO domain

You have defined your first storage domain to store virtual guest data, now it is time to configure your second storage domain, which will be used to store installation images for creating virtual machines. You have already created a local ISO domain during the installation of the Red Hat Enterprise Virtualization

Manager. To use this ISO domain, attach it to a data center.

To attach the ISO domain

1. Navigate to the **Tree** pane and click the **Expand All** button. Click **Default**. On the results list, the **Default** data center displays.
2. On the details pane, select the **Storage** tab and click the **Attach ISO** button.
3. The **Attach ISO Library** dialog appears with the available ISO domain. Select it and click **OK**.

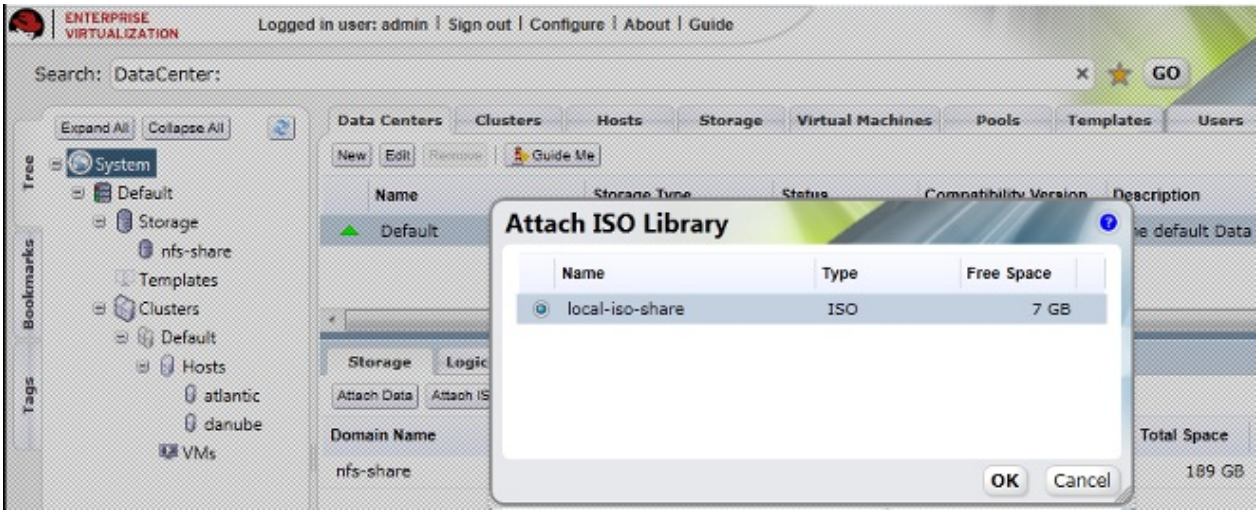

Figure 3.16. Attach ISO Library

4. The ISO domain appears in the results list of the **Storage** tab. It displays with the *Locked* status as the domain is being validated, then changes to *Inactive*.
5. Select the ISO domain and click the **Activate** button. The status changes to *Locked* and then to *Active*.

Media images (CD-ROM or DVD-ROM in the form of ISO images) must be available in the ISO repository for the virtual machines to use. To do so, Red Hat Enterprise Virtualization provides a utility that copies the images and sets the appropriate permissions on the file. The file provided to the utility and the ISO share have to be accessible from the Red Hat Enterprise Virtualization Manager.

Log in to the Red Hat Enterprise Virtualization Manager server console to upload images to the ISO domain.

To upload ISO images

1. Create or acquire the appropriate ISO images from boot media. Ensure the path to these images is accessible from the Red Hat Enterprise Virtualization Manager server.
2. The next step is to upload these files. First, determine the available ISO domains by running:

```
# rhevm-iso-uploader list
```

You will be prompted to provide the admin user password which you use to connect to the administration portal. The tool lists the name of the ISO domain that you attached in the previous section.

```
ISO Storage Domain List:
  local-iso-share
```

Now you have all the information required to upload the required files. On the Manager console, copy your installation images to the ISO domain. For your images, run:

```
# rhevm-iso-uploader upload -i local-iso-share [file1] [file2] .... [fileN]
```

You will be prompted for the admin user password again, provide it and press **Enter**.

Note that the uploading process can be time consuming, depending on your storage performance.

3. After the images have been uploaded, check that they are available for use in the Manager administration portal.
    a. Navigate to the **Tree** and click the **Expand All** button.
    b. Under **Storage**, click on the name of the ISO domain. It displays in the results list. Click on it to display its details pane.
    c. On the details pane, select the **Images** tab. The list of available images should be populated with the files which you have uploaded. In addition, the **RHEV-toolsSetup.iso** and **virtio-win.vfd** images should have been automatically uploaded during installation.

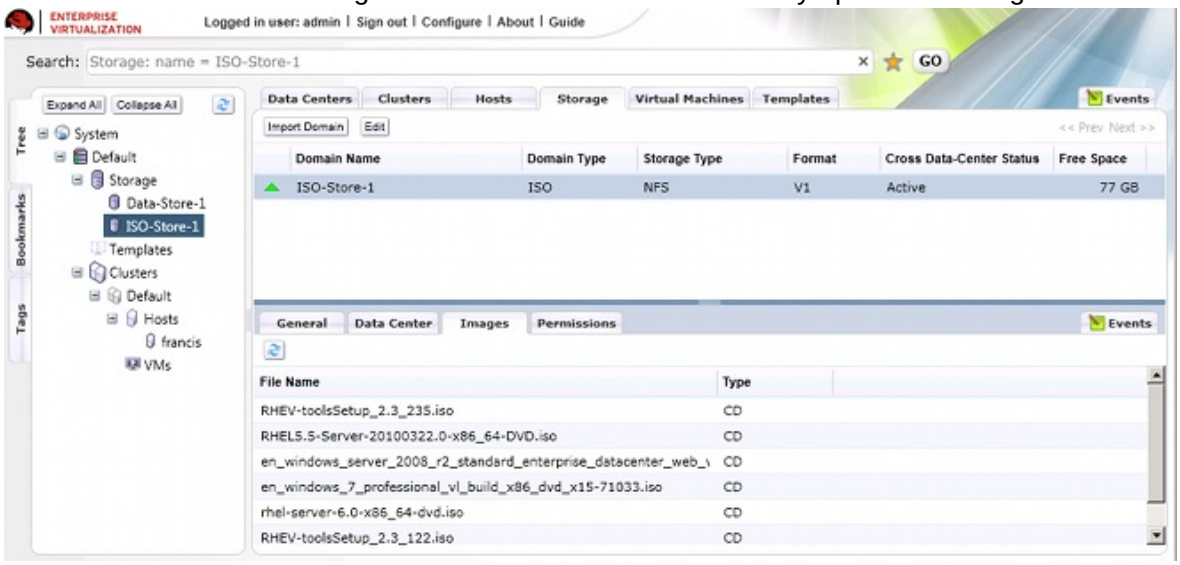

Figure 3.17. Uploaded ISO images

Now that you have successfully prepared the ISO domain for use, you are ready to start creating virtual machines.

Chapter 4. Manage Virtual Machines

The final stage of setting up Red Hat Enterprise Virtualization is the virtual machine lifecycle - spanning the creation, deployment and maintenance of virtual machines; using templates; and configuring user permissions. This chapter will also show you how to log in to the user portal and connect to virtual machines.

4.1. Create Virtual Machines

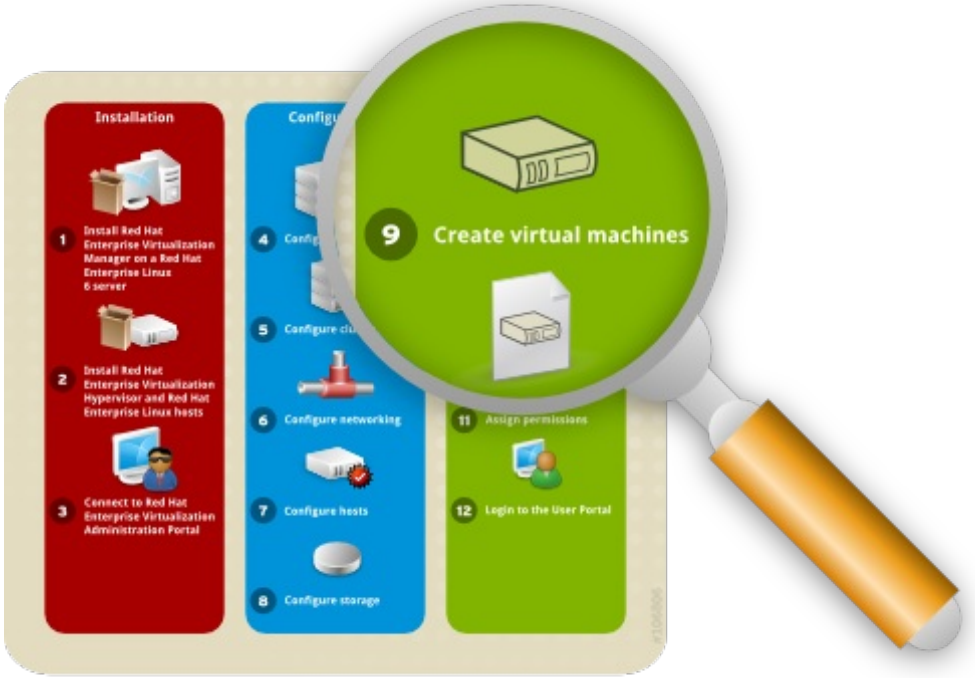
Installation
1 Install Red Hat Enterprise Virtualization Manager on a Red Hat Enterprise Linux 6 server
2 Install Red Hat Enterprise Virtualization Hypervisor and Red Hat Enterprise Linux hosts
3 Connect to Red Hat Enterprise Virtualization Administration Portal
4
5
6 Configure networking
7 Configure hosts
8 Configure storage
9 Create virtual machines
11 Assign permissions
12 Login to the User Portal

Figure 4.1. Create Virtual Machines

On Red Hat Enterprise Virtualization, you can create virtual machines from an existing template, as a clone, or from scratch. Once created, virtual machines can be booted using ISO images, a network boot (PXE) server, or a hard disk. This document provides instructions for creating a virtual machine using an ISO image.

4.1.1. Create a Red Hat Enterprise Linux Virtual Machine

In your current configuration, you should have at least one host available for running virtual machines, and uploaded the required installation images to your ISO domain. This section guides you through the creation of a Red Hat Enterprise Linux 6 virtual server. You will perform a normal attended installation using a virtual DVD.

To create a Red Hat Enterprise Linux server

1. Navigate to the **Tree** pane and click **Expand All**. Click the **VMs** icon under the Default cluster. On the **Virtual Machines** tab, click **New Server**.

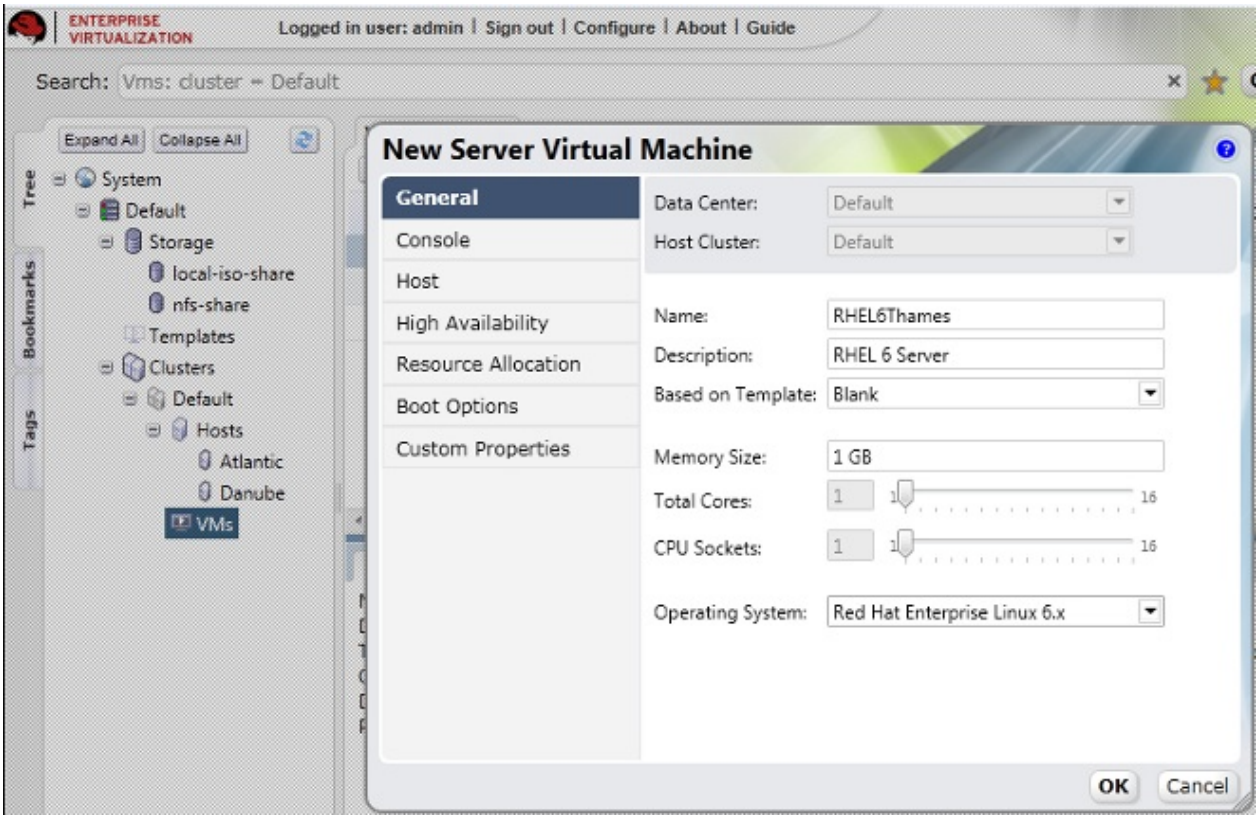

Figure 4.2. Create New Linux Virtual Machine

You only need to fill in the **Name** field and select **Red Hat Enterprise Linux 6.x** as your **Operating System**. You may alter other settings but in this example we will retain the defaults. Click OK to create the virtual machine.

2. A **New Virtual Machine - Guide Me** window opens. This allows you to add networks and storage disks to the virtual machine.

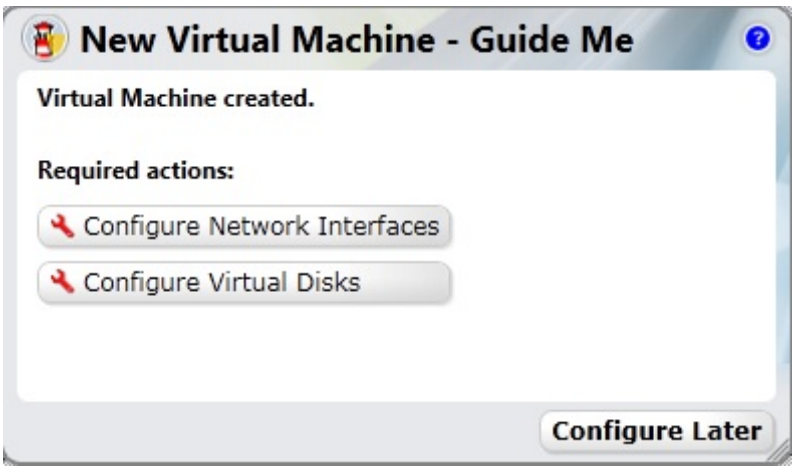

Figure 4.3. Create Virtual Machines

3. Click **Configure Network Interfaces** to define networks for your virtual machine. The parameters in the following figure are recommended, but can be edited as necessary. When you have configured your required settings, click **OK**.

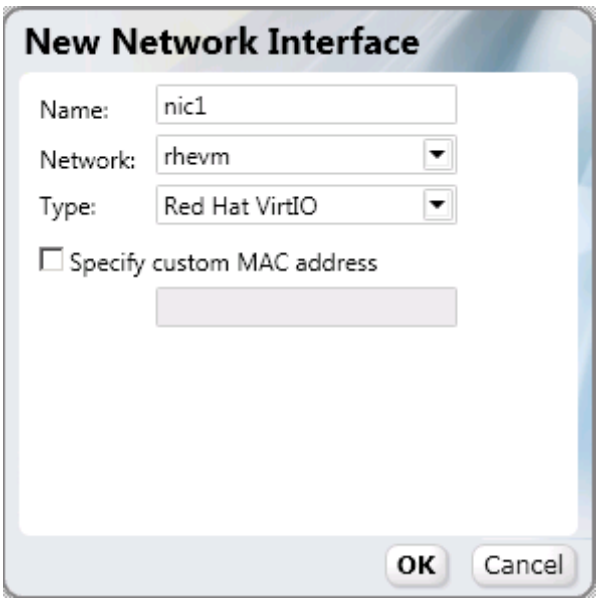

Figure 4.4. New Network Interface configurations

4. You are returned to the Guide Me window. This time, click **Configure Virtual Disks** to add storage to the virtual machine. The parameters in the following figure are recommended, but can be edited as necessary. When you have configured your required settings, click **OK**.

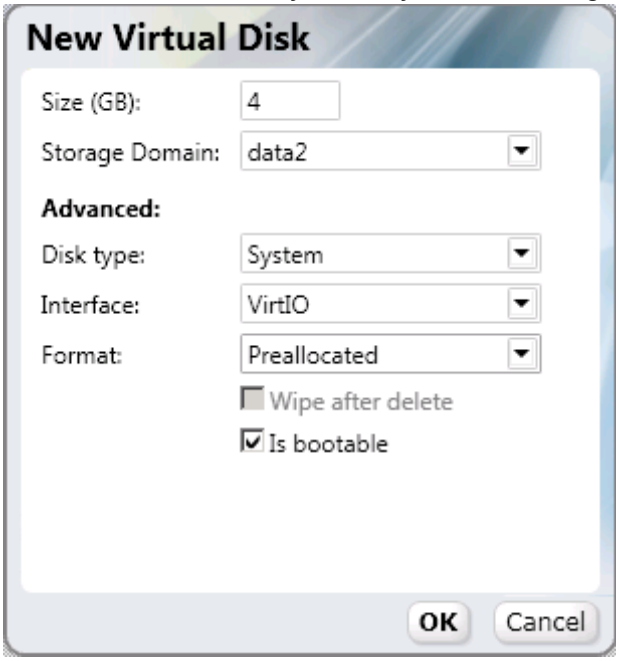

Figure 4.5. New Virtual Disk configurations

5. Close the Guide Me window by clicking **Configure Later**. Your new RHEL 6 virtual machine will display in the **Virtual Machines** tab.

You have now created your first Red Hat Enterprise Linux virtual machine. Before you can use your virtual machine, install an operating system on it.

To install the Red Hat Enterprise Linux guest operating system

1. Right click the virtual machine and select **Run Once**. Configure the following options:

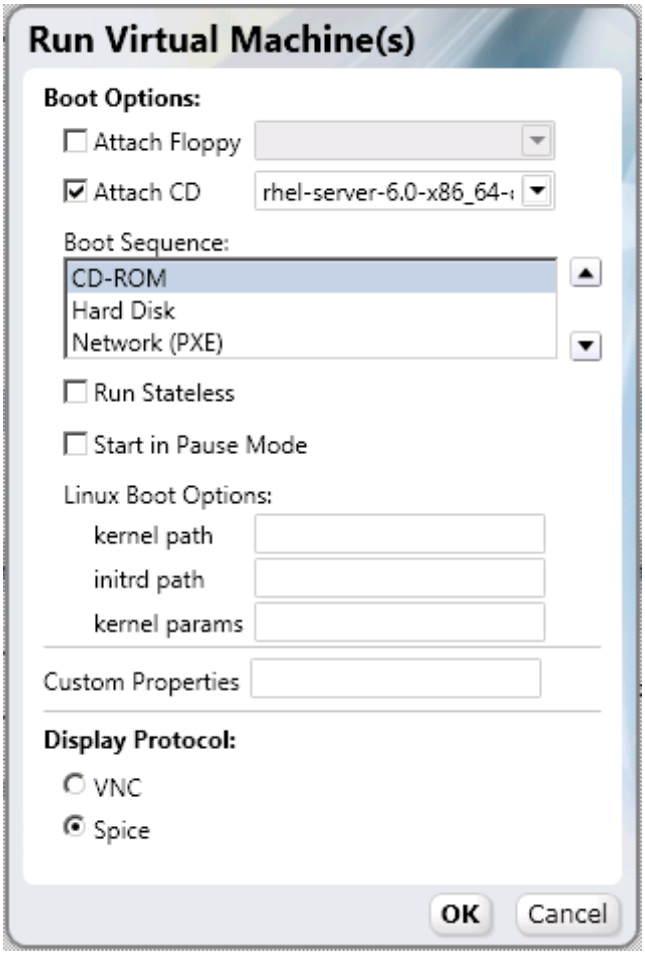

Figure 4.6. Run Red Hat Enterprise Linux Virtual Machine

- **Attach CD**: Red Hat Enterprise Linux 6
- **Boot Sequence**: CD-ROM
- **Display protocol**: SPICE

Retain the default settings for the other options and click **OK** to start the virtual machine.

2. Select the virtual machine and click the **Console** ( ) icon. As this is your first time connecting to the virtual machine, allow the installation of the Spice Active X and the SPICE client.
3. After the SPICE plugins have been installed, select the virtual machine and click the Console icon again. This displays a window to the virtual machine, where you will be prompted to begin installing the operating system. For further instructions, see the *Red Hat Enterprise Linux Installation Guide*.
4. After the installation has completed, shut down the virtual machine and reboot from the hard drive.

You can now connect to your Red Hat Enterprise Linux virtual machine and start using it.

4.1.2. Create a Windows Virtual Machine

You now know how to create a Red Hat Enterprise Linux virtual machine from scratch. The procedure of creating a Windows virtual machine is similar, except that it requires additional virtio drivers. This example uses Windows 7, but you can also use other Windows operating systems. You will perform a normal attended installation using a virtual DVD.

To create a Windows desktop

1. Navigate to the **Tree** pane and click **Expand All**. Click the **VMs** icon under the Default cluster. On the **Virtual Machines** tab, click **New Desktop**.

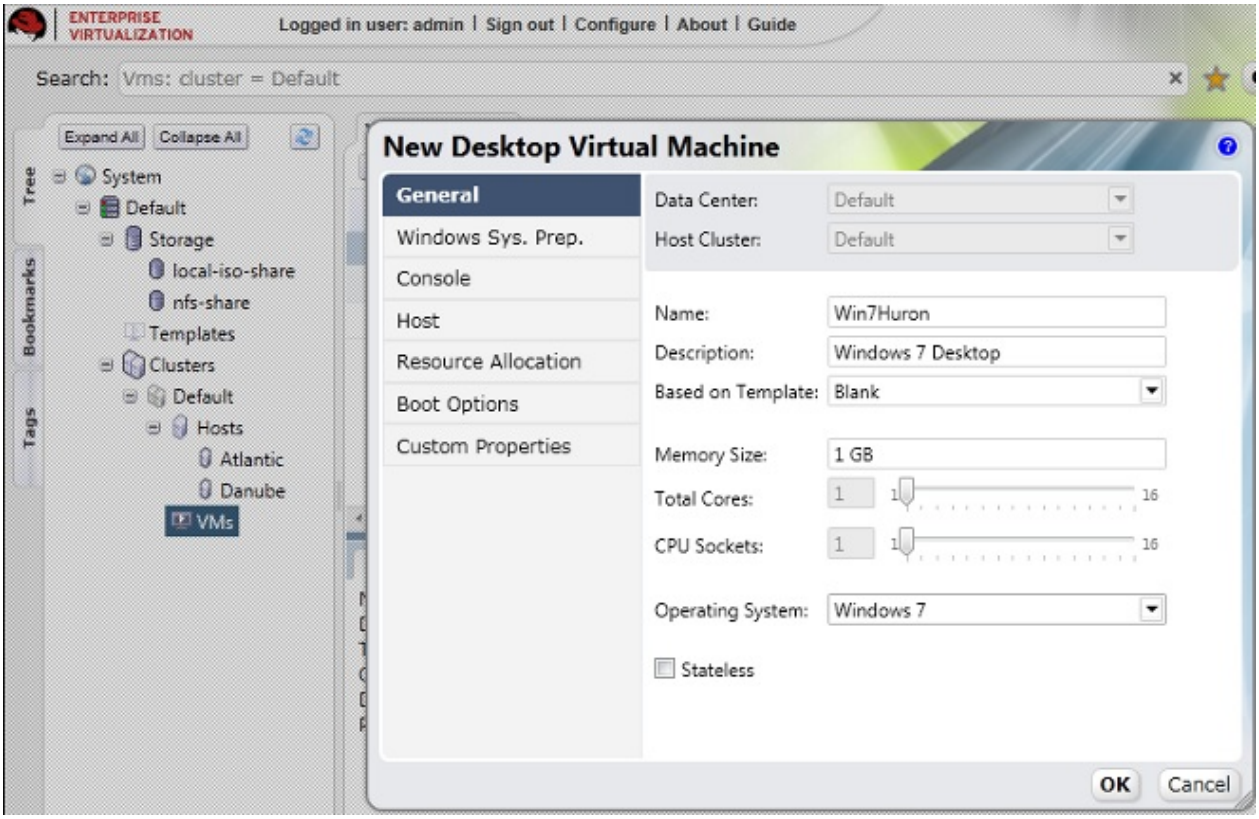

Figure 4.7. Create New Windows Virtual Machine

You only need to fill in the **Name** field and select **Windows 7** as your **Operating System**. You may alter other settings but in this example we will retain the defaults. Click OK to create the virtual machine.

2. A **New Virtual Machine - Guide Me** window opens. This allows you to define networks for the virtual machine. Click **Configure Network Interfaces**. See Figure 4.4, “New Network Interface configurations” for details.
3. You are returned to the Guide Me window. This time, click **Configure Virtual Disks** to add storage to the virtual machine. See Figure 4.5, “New Virtual Disk configurations” for details.
4. Close the Guide Me windows. Your new Windows 7 virtual machine will display in the **Virtual Machines** tab.

To install Windows guest operating system

1. Right click the virtual machine and select **Run Once**. The Run Once dialog displays as in Figure 4.6, “Run Red Hat Enterprise Linux Virtual Machine”. Configure the following options:
   - **Attach Floppy**: virtio-win
   - **Attach CD**: Windows 7
   - **Boot sequence**: CD-ROM
   - **Display protocol**: SPICE

   Retain the default settings for the other options and click **OK** to start the virtual machine.
2. Select the virtual machine and click the **Console** ( ) icon. This displays a window to the virtual machine, where you will be prompted to begin installing the operating system.

3. Accept the default settings and enter the required information as necessary. The only change you must make is to manually install the VirtIO drivers from the virtual floppy disk (vfd) image. To do so, select the **Custom (advanced)** installation option and click **Load Driver**. Press Ctrl and select:
   - **Red Hat VirtIO Ethernet Adapter**
   - **Red Hat VirtIO SCSI Controller**

   The installation process commences, and the system will reboot itself several times.
4. Back on the administration portal, when the virtual machine's status changes back to *Up*, right click on it and select **Change CD**. From the list of images, select **RHEV-toolsSetup** to attach the Guest Tools ISO which provides features including USB redirection and SPICE display optimization.
5. Click **Console** and log in to the virtual machine. Locate the CD drive to access the contents of the Guest Tools ISO, and launch the **RHEV-toolsSetup** executable. After the tools have been installed, you will be prompted to restart the machine for changes to be applied.

You can now connect to your Windows virtual machine and start using it.

4.2. Using Templates

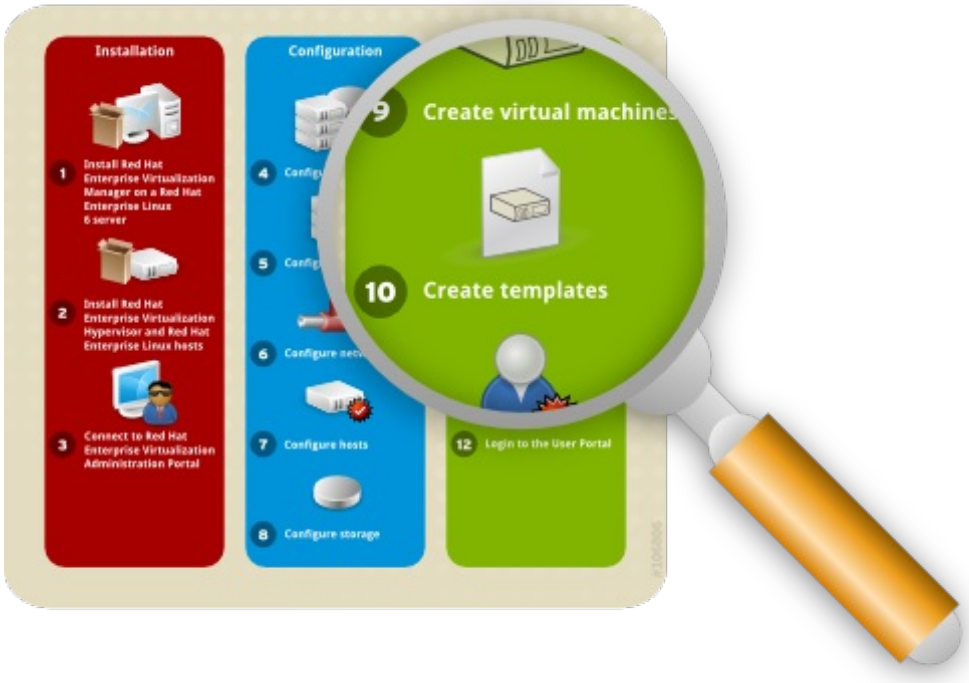
Installation
Configuration
9 Create virtual machines
10 Create templates
1 Install Red Hat Enterprise Virtualization Manager on a Red Hat Enterprise Linux 6 server
2 Install Red Hat Enterprise Virtualization Hypervisor and Red Hat Enterprise Linux hosts
3 Connect to Red Hat Enterprise Virtualization Administration Portal
4
5
6
7 Configure hosts
8 Configure storage
12 Login to the User Portal

Figure 4.8. Create Templates

Now that you know how to create a virtual machine, you can save its settings into a template. This template will retain the original virtual machine's configurations, including virtual disk and network interface settings, operating systems and applications. You can use this template to rapidly create replicas of the original virtual machine.

4.2.1. Create a Red Hat Enterprise Linux Template

To make a Red Hat Enterprise Linux virtual machine template, use the virtual machine you created in Section 4.1.1, “Create a Red Hat Enterprise Linux Virtual Machine” as a basis. Before it can be used, it has to be sealed. This ensures that machine-specific settings are not propagated through the template.

To prepare a Red Hat Enterprise Linux virtual machine for use as a template

1. Connect to the Red Hat Enterprise Linux virtual machine to be used as a template. Flag the system for re-configuration by running the following command as root:

```
# touch /.unconfigured
```

2. Remove ssh host keys. Run:

```
# rm -rf /etc/ssh/ssh_host_*
```

3. Shut down the virtual machine. Run:

```
# poweroff
```

4. The virtual machine has now been sealed, and is ready to be used as a template for Linux virtual machines.

To create a template from a Red Hat Enterprise Linux virtual machine

1. In the administration portal, click the **Virtual Machines** tab. Select the sealed Red Hat Enterprise Linux 6 virtual machine. Ensure that it has a status of **Down**.
2. Click **Make Template**. The **New Virtual Machine Template** displays.

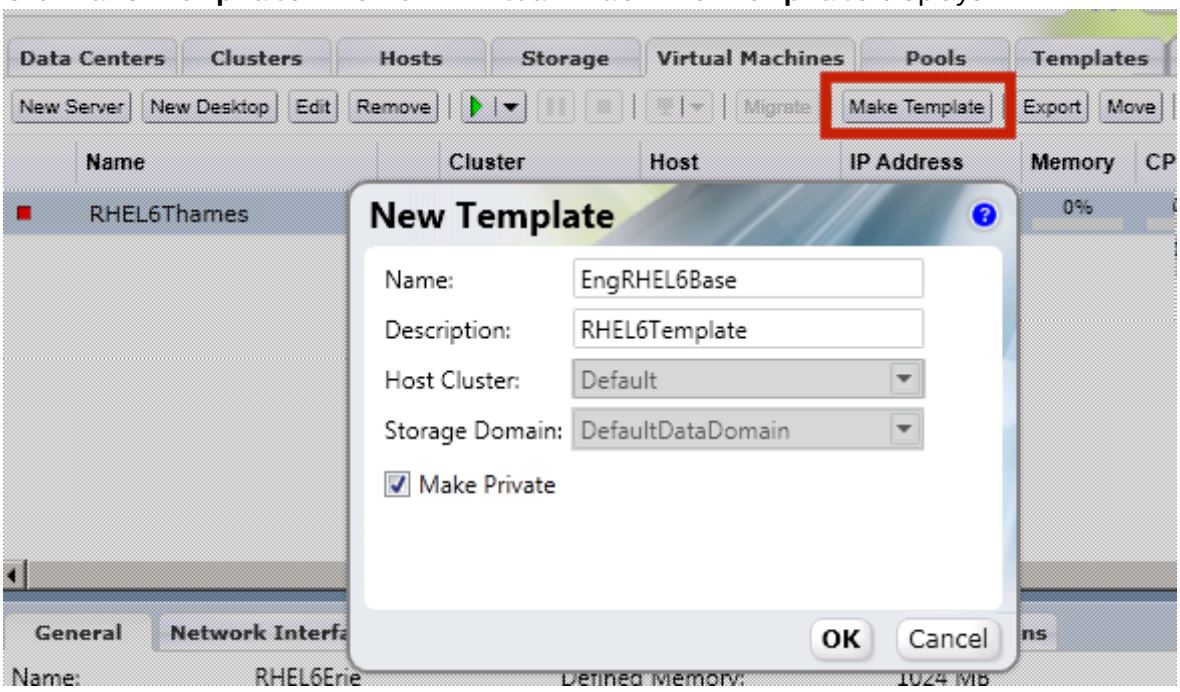

Figure 4.9. Make new virtual machine template

Enter information into the following fields:

- **Name**: Name of the new template
- **Description**: Description of the new template
- **Host Cluster**: The Host Cluster for the virtual machines using this template.
- **Make Private**: If you tick this checkbox, the template will only be available to the template's creator and the administrative user. Nobody else can use this template unless they are given permissions by the existing permitted users.

3. Click **OK**. The virtual machine displays a status of "Image Locked" while the template is being created. The template is created and added to the Templates tab. During this time, the action buttons for the template remain disabled. Once created, the action buttons are enabled and the template is ready for use.

4.2.2. Clone a Red Hat Enterprise Linux Virtual Machine

In the previous section, you created a Red Hat Enterprise Linux template complete with pre-configured storage, networking and operating system settings. Now, you will use this template to deploy a pre-installed virtual machine.

To clone a Red Hat Enterprise Linux virtual machine from a template

1. Navigate to the **Tree** pane and click **Expand All**. Click the **VMs** icon under the Default cluster. On the **Virtual Machines** tab, click **New Server**.

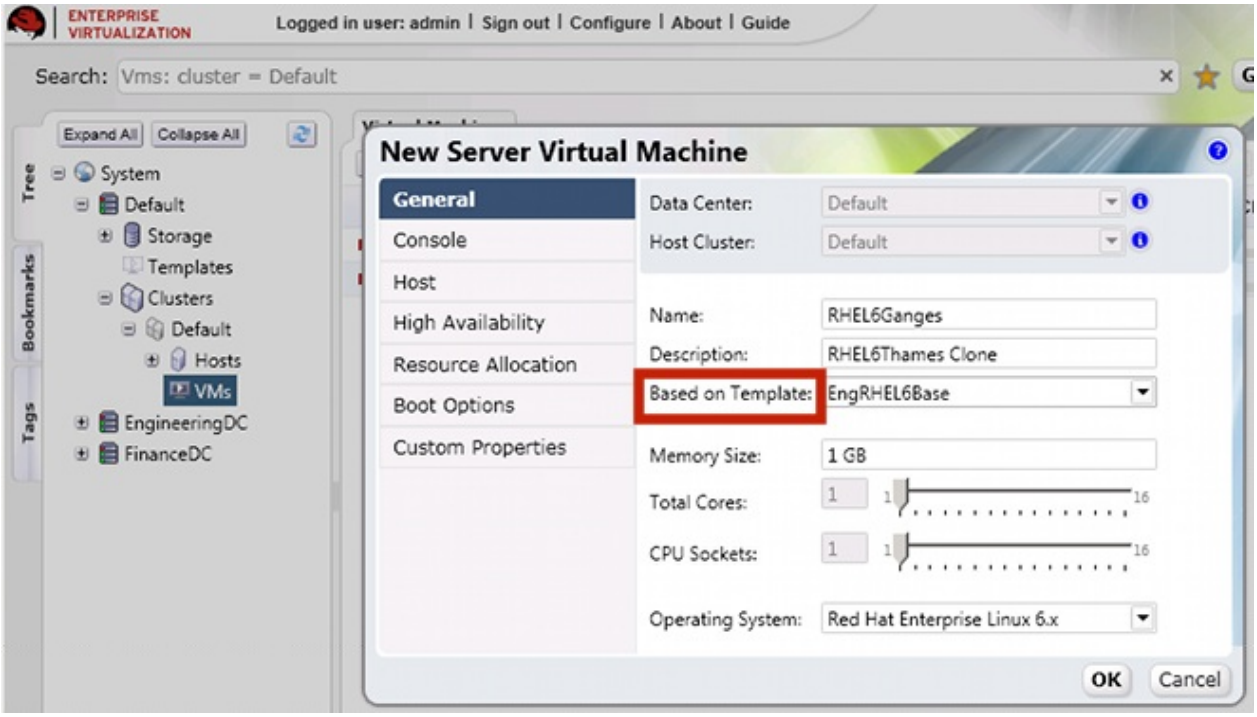

Figure 4.10. Create virtual machine based on Linux template

   a. On the **General** tab, select the existing Linux template from the **Based on Template** list.
   b. Enter a suitable **Name** and appropriate **Description**, then accept the default values inherited from the template in the rest of the fields. You can change them if needed.
   c. Click the **Resource Allocation** tab. On the **Provisioning** field, click the drop down menu and select the *Clone* option.

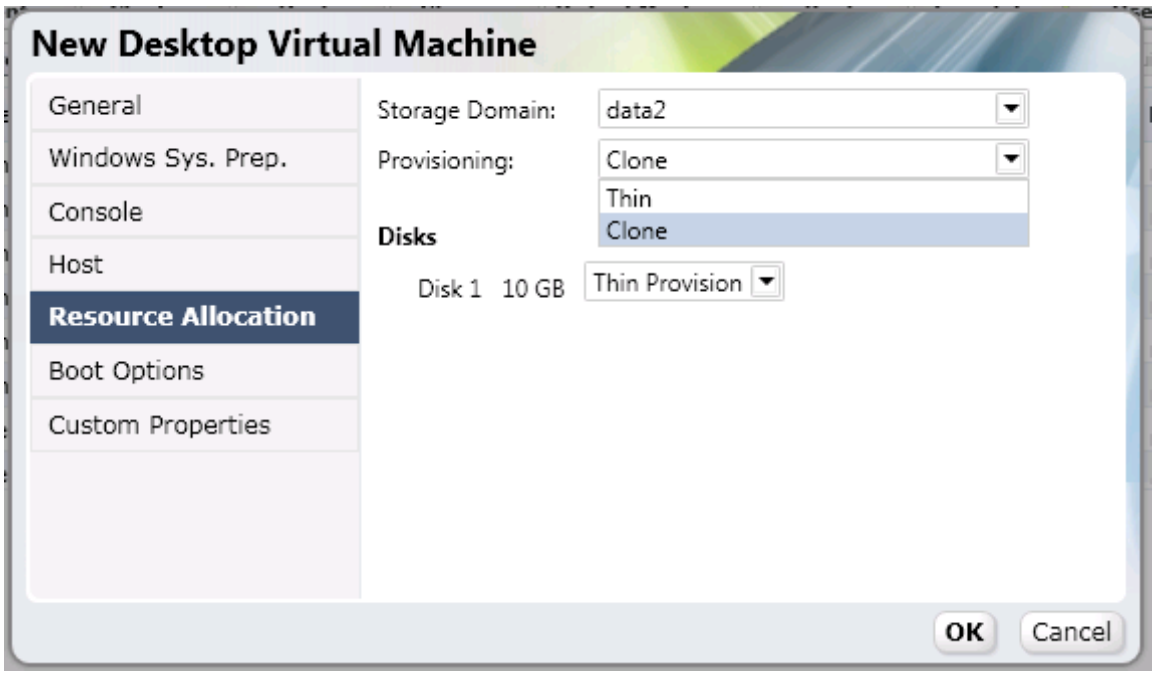

Figure 4.11. Set the provisioning to Clone

2. Retain all other default settings and click **OK** to create the virtual machine. The virtual machine displays in the Virtual Machines list.

4.2.3. Create a Windows Template

To make a Windows virtual machine template, use the virtual machine you created in Section 4.1.2, "Create a Windows Virtual Machine" as a basis.

Before a template for Windows virtual machines can be created, it has to be sealed with **sysprep**. This ensures that machine-specific settings are not propagated through the template.

Note that the procedure below is applicable for creating Windows 7 and Windows 2008 R2 templates. If you wish to seal a Windows XP template, refer to the *Red Hat Enterprise Virtualization Administration Guide*.

To seal a Windows virtual machine with sysprep

1. In the Windows virtual machine to be used as a template, open a command line terminal and type **regedit**.
2. The **Registry Editor** window displays. On the left pane, expand **HKEY_LOCAL_MACHINE → SYSTEM → SETUP**.
3. On the main window, right click to add a new string value using **New → String Value**. Right click on the file and select **Modify**. When the **Edit String** dialog box displays, enter the following information in the provided text boxes:
   - Value name: **UnattendFile**
   - Value data: **a:\sysprep.inf**
4. Launch sysprep from **C:\Windows\System32\sysprep\sysprep.exe**
   - Under **System Cleanup Action**, select **Enter System Out-of-Box-Experience (OOBE)**.
   - Tick the **Generalize** checkbox if you need to change the computer's system identification number (SID).

- Under **Shutdown Options**, select **Shutdown**.

Click **OK**. The virtual machine will now go through the sealing process and shut down automatically.

To create a template from an existing Windows machine

1. In the administration portal, click the **Virtual Machines** tab. Select the sealed Windows 7 virtual machine. Ensure that it has a status of **Down** and click **Make Template**.
2. The **New Virtual Machine Template** displays. Enter information into the following fields:
   - **Name**: Name of the new template
   - **Description**: Description of the new template
   - **Host Cluster**: The Host Cluster for the virtual machines using this template.
   - **Make Public**: Check this box to allow all users to access this template.
3. Click **OK**. In the **Templates** tab, the template displays the "Image Locked" status icon while it is being created. During this time, the action buttons for the template remain disabled. Once created, the action buttons are enabled and the template is ready for use.

You can now create new Windows machines using this template.

4.2.4. Create a Windows Virtual Machine from a Template

This section describes how to create a Windows 7 virtual machine using the template created in Section 4.2.3, “Create a Windows Template”.

To create a Windows virtual machine from a template

1. Navigate to the **Tree** pane and click **Expand All**. Click the **VMs** icon under the Default cluster. On the **Virtual Machines** tab, click **New Desktop**.
   a. Select the existing Windows template from the **Based on Template** list.
   b. Enter a suitable **Name** and appropriate **Description**, and accept the default values inherited from the template in the rest of the fields. You can change them if needed.
2. Retain all other default setting and click **OK** to create the virtual machine. The virtual machine displays in the Virtual Machines list with a status of "Image Locked" until the virtual disk is created. The virtual disk and networking settings are inherited from the template, and do not have to be reconfigured.
3. Click the **Run** icon to turn it on. This time, the **Run Once** steps are not required as the operating system has already been installed onto the virtual machine hard drive. Click the green **Console** button to connect to the virtual machine.

You have now learned how to create Red Hat Enterprise Linux and Windows virtual machines with and without templates. Next, you will learn how to access these virtual machines from a user portal.

4.3. Using Virtual Machines

Now that you have created several running virtual machines, you can assign users to access them from the user portal. You can use virtual machines the same way you would use a physical desktop.

4.3.1. Assign User Permissions

Installation
Configuration
VM Lifecycle
1 Install Red Hat Enterprise Virtualization Manager on a Red Hat Enterprise Linux 6 server
2 Install Red Hat Enterprise Virtualization Hypervisor and Red Hat Enterprise Linux hosts
3 Connect to Red Hat Enterprise Virtualization Administration Portal
4 Configure data ce
5 Configu
6 Config
7 Configure hos
8 Configure storage
Create templates
11 Assign permissions

Figure 4.12. Assign Permissions

Red Hat Enterprise Virtualization has a sophisticated multi-level administration system, in which customized permissions for each system component can be assigned to different users as necessary. For instance, to access a virtual machine from the user portal, a user must have either UserRole or PowerUserRole permissions for the virtual machine. These permissions are added from the manager administration portal. For more information on the levels of user permissions refer to the *Red Hat Enterprise Virtualization Administration Guide*.

To assign PowerUserRole permissions

1. Navigate to the **Tree** pane and click **Expand All**. Click the **VMs** icon under the Default cluster. On the **Virtual Machines** tab, select the virtual machine you would like to assign a user to.
2. On the **Details** pane, navigate to the **Permissions** tab. Click the **Add** button.
3. The **Add Permission to User** dialog displays. Enter a Name, or User Name, or part thereof in the **Search** textbox, and click **Go**. A list of possible matches display in the results list.

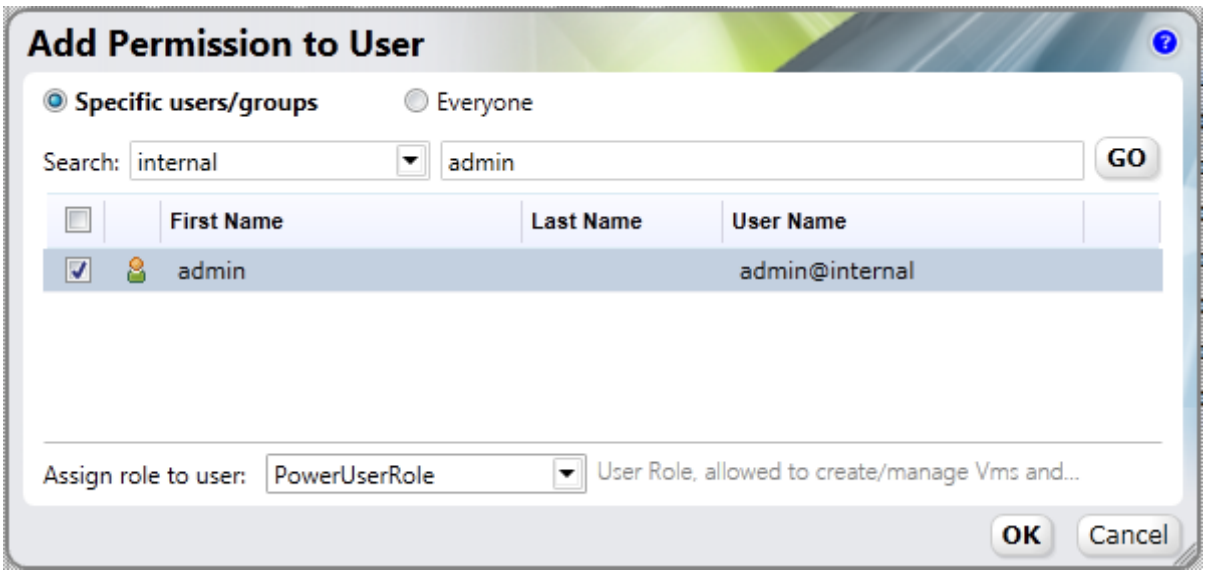

Figure 4.13. Add PowerUserRole Permission

4. Select the check box of the user to be assigned the permissions. Scroll through the **`Assign role to user`** list and select **`PowerUserRole`**. Click **`OK`**.

4.3.2. Log in to the User Portal

Figure 4.14. Connect to the User Portal

Now that you have assigned PowerUserRole permissions on a virtual machine to the user named

admin, you can access the virtual machine from the user portal. To log in to the user portal, all you need is a Linux client running Mozilla Firefox or a Windows client running Internet Explorer.

If you are using a Red Hat Enterprise Linux client, install the SPICE plug-in before logging in to the User Portal. Run:

```
# yum install spice-xpi
```

To log in to the User Portal

1. Open your browser and navigate to **https://domain.example.com:8443/UserPortal**. Substitute **domain.example.com** with the Red Hat Enterprise Virtualization Manager server address.
2. The login screen displays. Enter your **User Name** and **Password**, and click **Login**.

You have now logged into the user portal. As you have PowerUserRole permissions, you are taken by default to the Extended User Portal, where you can create and manage virtual machines in addition to using them. This portal is ideal if you are a system administrator who has to provision multiple virtual machines for yourself or other users in your environment. For more information, see the *Red Hat Enterprise Virtualization Power User Portal Guide*.

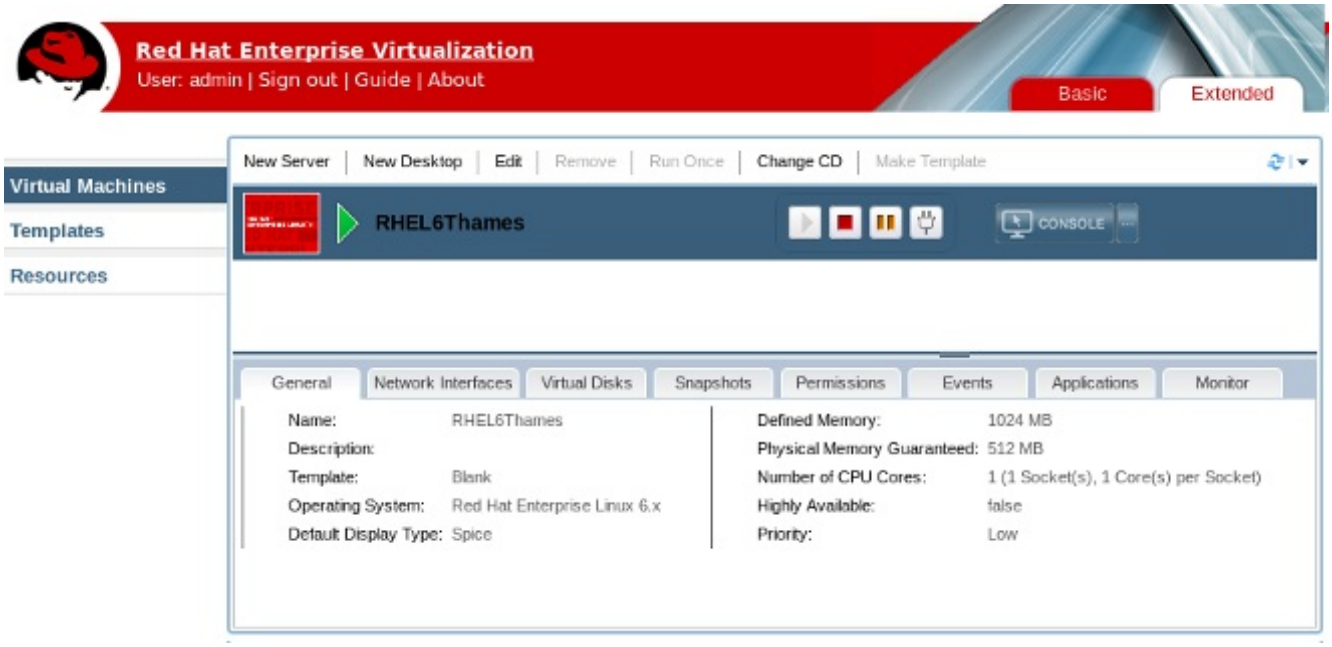

Figure 4.15. The Extended User Portal

You can also toggle to the Basic User Portal, which is the default (and only) display for users with UserRole permissions. This portal allows users to access and use virtual machines, and is ideal for everyday users who do not need to make configuration changes to the system. For more information, see the *Red Hat Enterprise Virtualization User Portal Guide*.

Figure 4.16. The Basic User Portal

You have now completed the Quick Start Guide, and successfully set up Red Hat Enterprise Virtualization. However, this is just the first step for you to familiarize yourself with basic Red Hat Enterprise Virtualization operations. You can further customize your own unique environment based on your organization's needs by working with our solution architects. To learn more visit the Red Hat Customer Portal at https://access.redhat.com/home.

Revision History

Revision 1-19.400	**2013-10-31**	**Rüdiger Landmann**
Rebuild with publican 4.0.0		
Revision 1-19	**2012-07-18**	**Anthony Towns**
Rebuild for Publican 3.0		
Revision 1-17	**Friday Mar 16 2012**	**Tim Hildred**
BZ#795841: Backported change clarifying channel locations.		
Revision 1-7	**Friday December 2 2011**	**Cheryn Tan**
Red Hat Enterprise Virtualization General Availability.		
Revision 1-6	**Tuesday October 4 2011**	**Cheryn Tan**
Red Hat Enterprise Virtualization External Beta 3.		
Revision 1-5	**Monday September 19 2011**	**Cheryn Tan**
Red Hat Enterprise Virtualization External Beta 2.		
Revision 1-4	**Tuesday August 3 2011**	**Cheryn Tan**
Red Hat Enterprise Virtualization External Beta 1.		
Revision 1-3	**Monday June 13 2011**	**Cheryn Tan**
Added workflow diagrams at the beginning of each chapter		
Revision 1-2	**Monday May 30 2011**	**Cheryn Tan**
Added architecture diagram, rearranged target audience section, rearranged installation steps		
Revision 1-1	**Thursday April 28 2011**	**Cheryn Tan**
Edited to include sections on using different storage types and templates		
Revision 1-0	**Thursday April 21 2011**	**Cheryn Tan**
Initial creation of book by Publican		